1952

# Management aspects of and educational criteria for school lunch programs in Iowa

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# MANAGEMENT ASPECTS OF AND EDUCATIONAL CRITERIA FOR SCHOOL LUNCH PROGRAMS IN IOWA

by

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A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of
The Requirements for the Degree of
DOCTOR OF PHILOSOPHY

Major Subjects: Institution Management
Vocational Education

Approved:

Signature was redacted for privacy.
In Charge of Major Work

Signature was redacted for privacy.
Heads of Major Departments

Signature was redacted for privacy.
Dean of Graduate College

Iowa State College
1952

UMI Number: DP13184



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# INTRODUCTION

The efficient management and operation of school lunch programs to provide attractive, palatable and nutritionally adequate meals and the realization of the educational potentialities of such programs are recognized as important aspects of feeding children at school. At the National School Lunch Conference in 1946, Stiebeling (98, p. 4) emphasized these phases of the program when she stated that "the school-lunch is both an educational and a food management program." Todhunter stressed a need for extensive research to solve some of the problems involved in managing lunch programs and determining their educational effectiveness. She believed that results of research from related fields could be applied but pointed out the unique problems which school lunch programs present (108, p. 80):

> The organization of the school lunch program, its place in the total educational program, the age of the group it serves, the limited funds for operation, and the necessity for using large numbers of untrained workers mean that the situations encountered are different from those in home, commercial or institution feeding. It is a program with its own characteristic problems.

A study of the management aspects of lunch programs and of the educational opportunities which they afford can show existing conditions and current trends and indicate specific needs for efficient operation and the achievement of educational objectives.

## TRENDS IN THE DEVELOPMENT OF SCHOOL LUNCH PROGRAMS

The development of school lunch programs in the United States has progressed through various phases since 1853. Several factors underlying the trends in the expansion of the lunch program are evident: recognition of the need for providing nourishing food for children, the rapid growth of secondary schools in large cities, the interest of home economists in the program, financial problems during the depression years and the subsequent granting of federal aid for feeding school children.

The basic purpose of supplying nourishing food for children was influential in the early development of the school lunch program. In 1853 the Children's Aid Society of New York City served meals in industrial schools not only to induce attendance but to feed the hungry children (15). "Penny lunch programs" were started by benevolent organizations in several other cities to provide low cost supplements to lunches brought from home.

The first lunch program sponsored by a school was organized in 1894 when the Boston School Committee gave Ellen H. Richards the responsibility of directing the production and service of food (18). In addition to the importance of providing nourishing food, Mrs. Richards was

aware of other values to be derived from school feeding programs. Hunt referred to these values when she described the development of school lunch programs and discussed the objectives to be attained through providing meals for school children (43, p. 130):

> It was the recognition of the dangers lurking in the food sold to school children, and also the realization of the vast educational opportunities that were being thrown away, that led Mrs. Ellen H. Richards in 1894 to begin her very valuable work of serving simple luncheons to the students of the high schools of Boston.

During the period from 1894 through 1903, lunch programs were established in the high schools of Boston, Philadelphia, Cleveland, Chicago, St. Louis and Rochester, New York (56). Reasons for serving lunches in schools in large cities were summarized by Kinne (52, p. 48):

> The practice of giving luncheons to school children in the school building is becoming common in our large cities. The necessity for this has arisen from conditions that make it impossible for children to go home at the proper hour, and also from the fact that food brought by the children themselves is often undesirable. The school luncheon originated in an attempt to furnish something, such as milk, cocoa, or soup, to supplement the luncheon brought from home. Where this experiment was tried the articles served were in demand immediately. From this unpretentious beginning has grown a more adequate luncheon, which in several instances meets the requirements of nutrition, and is on a paying basis.

The development of lunch programs in elementary schools progressed more slowly but Bryant (20) reported that by 1913 lunch programs had been established in the elementary

school systems of thirty cities.

During this period of expansion of lunch programs, little attention was given to providing a varied menu. In many schools only one hot food was served. In a few of the large high schools several items were offered from which children could make a choice and some attempt was made to teach these pupils the wise selection of food.

The development of lunch programs in large schools presented problems in management and operation. In several cities welfare agencies and benevolent organizations operated the school lunch. In others the school administration was responsible for the program but equipment was expensive, there were financial problems and the school administrator found it difficult to obtain personnel to operate the lunch program. Consequently in some schools concessionaires were permitted to take over the management, but operating the school lunch as a business for profit did not always furnish nourishing food for the children.

By 1913 interest in school feeding had extended to a few rural schools. Acquiring equipment and personnel for preparing food was a greater financial problem for these smaller schools and the development of an extensive lunch program in rural areas was slow until federal aid was granted.

A meeting of the International Congress of School Hygiene in 1913 gave impetus to a more scientific approach

to school feeding which resulted in a trend toward school control of lunch programs (18). At this meeting problems in management were discussed as well as the nutritional adequacy of the lunch and the social and educational values of the program. The importance of the contribution of home economists with food service experience to the development of lunch programs was stressed.

By 1920 most schools had assumed responsibility for the operation and management of the lunch program and a few had recognized the educational value of the school lunch. In 1920, when describing the development of lunch programs in the Philadelphia school system, Smedley emphasized the value of making the school lunch a part of the educational program of the school (92, p. 5):

> The beneficial results to the children who received wholesome food provided by reliable agencies, and the general focusing of public attention on the subject of malnutrition of children, gradually awakened school boards to the fact that feeding was a legitimate part of the educational plan. . . .
>
> The aim of the school lunch is two-fold: to meet the food requirements of the child, helping to lay a foundation of physical vigor upon which the structure of mental training can be effectively built; and to serve as an educational factor, instilling wise food habits, offering an opportunity for lessons in courtesy and consideration, and providing a laboratory for the practical demonstration of allied subjects of study such as cooking, hygiene, buying.

At the same time Fisher (31) recommended that since lunch programs were considered to be a part of the school

system, school funds should be used for the establishment of such programs as well as for the overhead expenses necessary for their operation.

The period from 1920 to 1930 was one of rapid expansion for school lunch programs throughout the country (56). There was more money available for schools than in previous years. Home economists with institution management and dietetic training played an active part in the development and supervision of lunch programs. Some home economics teachers assisted with menu planning and other phases of management and operation. During this time emphasis was given to efficient management, the provision of adequate space and equipment, the nutritional adequacy of the lunches, the importance of making lunches available to all students and the wise selection of food. In some schools there was no choice of menu items; instead an adequate meal was provided.

At this time, when lunch programs were being established in many high schools in cities, some school administrators and home economists studied current trends in school lunch administration (40)(54)(34). Although most of the research was limited almost exclusively to studies of the management of lunch programs, attempts were made to determine the educational values of the school cafeterias.

In 1931 it was estimated that meals were served to children in 64,500 schools and in 11,500 additional schools

one hot food was served. During the next few years new lunch programs were started annually in 7,500 schools (35). This rapid expansion continued throughout the years of the economic depression of the thirties.

After 1930 more schools assumed responsibility for making nutritionally adequate lunches available to all children regardless of their ability to pay. Because of the increase in expense for lunches served to needy children, schools were having greater financial difficulties in operating their lunch programs. A few state legislatures provided money but to sustain the program throughout the entire country, increased federal aid was deemed advisable (35). The first federal aid to school feeding came as a result of direct action to move surplus foods from producers who could not use them to consumers who needed them. The Agricultural Adjustment Act of 1935 provided for the purchase of agricultural commodities by the government and their distribution to school lunch programs. At this same time additional federal aid was supplied by the Works Progress Administration and the National Youth Administration for reimbursing employees and supervisory personnel of school lunch programs (55).

Concern about the future of school lunch programs in the United States was indicated by several national organizations during this period of financial crises. In 1937 five associations representing home economists,

dietitians, school lunch managers, teachers and administrators held sessions in their annual meetings to discuss problems in school lunch management and methods of making the lunch program educational (83).

Between 1930 and 1940 school administrators, school lunch supervisors and other home economists continued to investigate the management and educational policies of lunch programs in high schools in large cities. The information obtained from these studies was summarized usually to indicate current trends in school lunch administration and to recommend standards to be used as guides for establishing new programs or reorganizing existing ones (97) (66) (82) (60) (42) (131) (61) (75). No record could be found of any such extensive studies conducted previous to 1940 in schools located in smaller towns and rural areas.

After 1939 and during the following ten years the number of schools participating in the National School Lunch Program increased rapidly. This was due in part to the provision of additional federal aid. In 1939 the Surplus Marketing Administration assumed the responsibility for extending aid to school lunch programs by donating foods which had been purchased by the United States Department of Agriculture to support the price of agricultural commodities. By 1942 the purchase of surplus commodities by the federal government was reduced and the School Lunch Indemnity Program

became effective in 1943 (74). From 1943 through 1945 Congress appropriated funds yearly with which to reimburse eligible schools for the purchase of agricultural commodities. With this extended aid, more lunch programs were established.

On June 4, 1946, the National School Lunch Act was passed (126). This act placed the school lunch program on a permanent basis to safeguard the health of the nation's school children and to encourage the domestic consumption of agricultural commodities (122). Authority was given the Secretary of Agriculture to carry out the terms of the act. Provision was made for appropriations to be allotted every year by Congress. A state educational agency in each state was to be responsible for the administration of the funds allocated to it. These funds were to be apportioned to the state according to the number of school children between the ages of five and seventeen and the relation of the per capita income in the United States to the per capita income in the particular state.

To receive maximum reimbursement for lunches served to students, a school which is participating in the National School Lunch Program is expected to provide a Type A lunch consisting of the following foods (122, p. 4):

1. One half pint of whole milk as a beverage.
2. Two ounces of lean meat, poultry, fish, or cheese, or one egg, or one half cup of cooked dried beans or peas, or four tablespoons of peanut butter.
3. Three fourths cup of vegetables or fruit or both.
4. One or more portions of bread or muffins or other bread made of whole-grain cereal or enriched flour.
5. Two tablespoons of butter or fortified margarine.

Participation in the National School Lunch Program increased from 29,641 schools in 1944 to 50,530 in 1950 (124). During this period of rapid development, representatives of the federal and state agencies responsible for the administration of the National School Lunch Program funds urged those who planned and organized lunch programs to provide a Type A lunch for students. Offering pupils a choice from several items of food was discouraged. Standards were suggested for management procedures, equipment, purchasing and menu planning (120) (123) (113) (114).

Since 1940 evaluation of the efficiency and standards of operation and the educational and nutritional effectiveness of school lunch programs has been emphasized increasingly. Surveys have been made in several states, counties, cities and rural areas throughout the United States. Research has been conducted on various phases of the management and operation of lunch programs. The educational possibilities and effectiveness of lunch programs have also been explored in some states. Studies have been initiated to determine the effect of the school lunch on the nutritional status of children in Alabama, Iowa, Kansas, North

Carolina and Ohio. The contribution of the school lunch to the improvement of the nutritional status of children has been investigated in Florida, Louisiana, Pennsylvania and South Carolina. Studies which have been completed have indicated that when adequate lunches were prepared under the supervision of trained managers, school lunches were effective in improving the nutritional status of children (106).

Until recently the data for a majority of the studies concerning school lunch programs have been collected through the use of questionnaires. There is a tendency, however, to obtain information about the various phases of school feeding programs by visiting schools to observe the lunch operation, interview students and personnel and review records.

Another trend in the development of school lunch programs since 1940 has been the increased emphasis on evaluation. Home economists and other educators believe that evaluation of various phases of lunch programs is necessary to indicate existing conditions and clarify objectives as a basis for improving the programs. Some administrators designed check lists with which to evaluate administrative policies, management procedures, financial control and sanitation (23) (104). School lunch supervisors and other home economists developed techniques for evaluating the management

and operation of lunch programs and determining the nutritional adequacy of the lunch and the educational effectiveness of the program (67) (109) (135) (105).

A variety of techniques has been used for evaluating lunch programs. In 1944 the United States Cooperating Committee on School Lunches (115) developed a form for appraising the management and operation of a lunch program, its physical facilities and the interest and participation of the school and community in the program. This committee was composed of representatives of the Federal Security Agency, Federal Works Agency, Office of Civilian Defense, Office of Price Administration, United States Department of Agriculture, United States Department of Labor, American National Red Cross and the National Congress of Parents and Teachers. The purpose of such an evaluation was stated when the form was revised in 1948 (121, p. 1):

> Since school lunch programs have sprung up all over the country. . . communities are realizing they often know too little about how they are operated, or how they should be operated. With increasing emphasis placed on nutrition of children, well-informed persons are eager to be assured that all pupils in the schools are being taught what to eat as well as what to read.
>
> The primary reason, then, for making a school lunch appraisal is to give the community and school an awareness of the existing conditions in the school lunch program in order that necessary improvements and extension may be assured.

The evaluation of some lunch programs has pointed out a need for training school lunch personnel as one means of

aiding schools to attain the objectives of such programs. Some training was required in 1935 when personnel was being supplied by the Works Progress Administration. There had been reports of training programs in a few states prior to 1935. Since 1943 workshops for school lunch personnel have been conducted in a number of states. In her study of the development of school lunch training programs throughout the country, Johnson (48) reported that programs had been held during the period from January 1, 1946, through May 31, 1949, in 27 of the 33 states from which her questionnaire was returned.

## THE DEVELOPMENT OF SCHOOL LUNCH PROGRAMS IN IOWA

Information concerning the early development of the school lunch program in Iowa is limited. According to Bangs (9), official records of the Iowa School Lunch Program prior to 1946 had been transferred to government archives and therefore were no longer available. Budolfson (21) examined some of the records previous to that time and reviewed the development of the lunch program in Iowa from 1941 through 1943. Little information about school lunch programs in Iowa prior to 1941 is available.

In 1916 Richardson (87) prepared a circular which outlined methods for serving one hot food as a supplement to the lunches brought from home. The food was to be prepared by the teacher and pupils and was for the purpose not only of supplying nutritious food but teaching food preparation and improving food habits.

An editorial (71) written in 1926 for the official publication of the Iowa State Teacher's Association pointed out that the lack of proper equipment and the added work for teachers were factors which prevented some schools from providing food for children. The "pint jar" method used in Adams county was described and suggested as an alternative. Food brought by pupils in a pint jar was heated at noon in

a steam bath. This involved a minimum of equipment to be supplied by the schools and a minimum amount of work for the teacher.

In 1931 Overn (80), describing methods of supplementing lunches brought from home, suggested that Iowa schools either use the "pint jar" method, furnish milk or plan to have children help prepare one hot food. She emphasized the educational and nutritional values of a planned lunch program.

An interest in the educational possibilities of lunch programs led Park (81) to study the opportunities which existed in lunch programs for attaining some of the objectives of home economics courses in certain Iowa schools. She concluded that there might be advantages in using the school lunch for teaching food preparation providing students were not exploited by making them responsible for all of the work involved in preparing and serving the lunch.

After investigating the possibilities for increasing the educational effectiveness of two high school cafeterias in Sioux City, Junkin recommended that (49, p. 124):

> . . . attempts be made to secure the cooperation of the cafeteria with other school departments and organizations and interest the other school departments in methods whereby the cafeteria can help them in the promotion of their program so that the whole educational program may be enriched.

Goldsmith (36) studied the kind and extent of food service responsibilities taken by high school home economics teachers in a sample of communities of Iowa in 1940. Forty-

four per cent of 154 teachers replying to her questionnaire were responsible to some extent for food service in a school cafeteria or lunchroom.

King (51) found that only two of 40 schools in South Central Iowa operated lunch programs during the school year 1939-40; the number had increased to 15 in 1940-41. This increase was attributed to the availability of federal aid during the latter school year. King also described the organization of a lunch program at Numa and pointed out the educational aspects and vocational possibilities of lunch programs in small Iowa schools.

Studying the progress in the development of school lunch programs in the state, Klayman reported that (55, p. 370):

> The School Lunch Program in Iowa has not developed as fast as in other states. In March 1941 only 15,659 children participated in the program, about 3 per cent of the total school enrollment of the state.
>
> The February 1941 survey showed that about 60 per cent of the participating children in the state came from rural communities. About 80 per cent of the children were served some sort of home meal, including almost 55 per cent that were served a complete lunch. About 7 per cent of the children were given only surplus commodities.

With the advent of federal aid for school lunch programs, interest in their establishment increased. According to Budolfson (21), personnel from the state office for the Food Distribution Administration contacted school administrators and community leaders in Iowa in 1942 to encourage

them to operate lunch programs with federal aid. The School Lunch Committee of the State Nutrition Council played an active role in promoting the organization of such lunch programs throughout the state. County home economists, state extension specialists and the nutritionist for the Iowa State Department of Health were effective in increasing community interest in the lunch program.

In 1942 after federal aid had been increased, the State Department of Public Instruction conducted surveys to determine the extent of school lunch programs in Iowa (21). Information about lunches in one-room rural schools was secured from county superintendents in 76 counties, 69 of which indicated some type of lunch programs in all or part of the one-room rural schools in those counties. Concurrently a similar survey of all other public schools of the state was made and replies were received from 594 of the 911 schools included in the survey. Only 244 schools were operating lunch programs.

The Department of Public Instruction continued to investigate the status of the school lunch program in Iowa. Information was obtained by the State Supervisor of Home Economics Education about lunch programs in schools with home economics departments receiving federal aid from vocational funds (21). Less than one half of these schools were operating lunch programs from 1941 through 1943. Home

economics teachers were responsible for some of these programs and pupils in home economics classes helped to plan menus and prepare and serve the lunches.

To determine some factors affecting the status of school lunch programs in Iowa in 1943, Budolfson (21) made a survey of a selected group of schools having vocational home economics departments. She concluded that federal aid was an important factor in the growth of the school lunch program in Iowa and that (21, p. 103):

> This study of school lunches falls far short of describing the extent to which school lunches are provided and the factors affecting such provision.

Her conclusions implied a need for more extensive research on the management and educational aspects of lunch programs in Iowa schools (21, p. 103a):

> Internal management of school lunches plays an important part in the success of any program and in the likelihood of its being continued. The conditions making for the success or failure of internal management seem worthy of intensive study. Such a study should prove useful for developing recommendations to guide the administration of school lunch programs.
>
> School lunches serve several purposes. This study indicates that school administrators are aware to only a very limited extent of the possibility of using school lunches as a means of teaching nutrition. It should be useful to make an intensive study of schools which have been very successful in using their lunch programs as a means of teaching better food habits.

That the Department of Public Instruction (44) was aware of the educational possibilities of the school lunch program was shown in 1944 when its plan for nutrition edu-

cation in the elementary schools was published. The school lunch was suggested as a part of the educational program which could provide opportunities for teaching nutrition and establishing a desire for good food habits.

Since 1944 the number of schools and pupils participating in the National School Lunch Program in Iowa has increased gradually as shown in these data obtained from statistics reported by the United States Production and Marketing Administration (124):

| Year | Number of Schools | Number of Pupils |
|---|---|---|
| 1944 | 574 | 70,235 |
| 1945 | 666 | 80,781 |
| 1946 | 776 | 100,274 |
| 1947 | 902 | 114,217 |
| 1948 | 892 | 116,456 |
| 1949 | 917 | 121,621 |
| 1950 | 1,009 | 142,817 |

Data concerning the schools operating lunch programs without federal aid were not available.

Since August, 1946, the school lunch program in Iowa has been directed by the Department of Public Instruction through the school lunch division. The Director of the Iowa School Lunch Program, C. W. Bangs, stated basic beliefs which should underlie the administration of a school where a lunch is provided (7, p. 17):

1. The school lunch should be an accepted part of the school administration program.
2. Food for the school lunch should be prepared under sanitary conditions and in a place where it can be eaten under pleasurable conditions.

3. The school lunch should be an integral part of the total educational program.
4. Home-making instruction and school lunch programs should be cooperative, but each group should be provided with its own space and facilities.
5. Parents and community groups should be aware of the value of school lunches.

In 1947 a state school lunch research project was organized by members of the Home Economics Division of Iowa State College. The following year pilot studies were initiated in some Iowa schools. Nutritional effectiveness, economic aspects, educational opportunities and management procedures of lunch programs were investigated in this initial research which was basic to the more extensive statewide research now in progress (11) (27) (59) (77) (89) (1) (45) (46) (58).

The Director of the Iowa School Lunch Program has indicated an interest in evaluating lunch programs (8). In 1950 he asked the administrators of three Iowa schools to appraise their lunch programs using the form prepared by the United States Interagency Committee on School Lunches (121). The time involved in making such an evaluation and suggestions for simplifying the procedure were reported by each of the three administrators. This information was utilized in promoting the use of the appraisal form in other schools throughout the state.

Another aspect in the development of school lunch programs in Iowa has been the recent emphasis on training

personnel. Each year since 1948 members of the Institution Management Department of Iowa State College and the State Department of Public Instruction have cooperated in conducting short courses for school lunch cook-managers at the college.

Other training programs for school lunch personnel have been conducted throughout the state since 1947 (10). The nutritionist for the Iowa School Lunch Program has held training conferences for school lunch personnel in several counties. These were informal meetings to which all lunch personnel in a county were invited to discuss problems in planning menus, preparing food and using commodities donated by the United States Department of Agriculture. Since 1948 information from the short course for cook-managers has been summarized and reported at these county meetings. Such conferences have been held each year in counties where the director of the Iowa School Lunch Program and school personnel believed there was the greatest need for training programs.

In the spring of 1948 food preservation conferences were held in three sections of the state with the assistance of a Food Preservation Specialist from the Department of Agriculture and a Nutrition Specialist from the Iowa State College Extension Service. School lunch personnel were encouraged to attend these conferences.

During the school years 1949-50 and 1950-51 one-day training programs for school lunch personnel were included as part of the tri-county school institutes in the southeastern and northeastern sections of the state. Similar training programs were conducted during 1951-52 in several counties at the request of the county superintendents. The director, nutritionist and field supervisors for the Iowa School Lunch Program participated in these conferences where all phases of school lunch management and operation were discussed.

# PART I

# MANAGEMENT ASPECTS OF SCHOOL LUNCH PROGRAMS IN IOWA

## STATEMENT OF PROBLEM

One of the purposes of the National School Lunch Act (122, p. 2) which became effective June 4, 1946, was "to safeguard the health and well-being of the Nation's children by encouraging them to eat more nutritious food." Home economists and other educators in Iowa, recognizing the numerous problems involved in achieving this objective, organized a state school lunch research project in 1947.

The Institution Management Department was one of the several departments in the Home Economics and Science Divisions of Iowa State College represented on the committee organized to plan and carry out this school lunch study. The research was a part of the North Central Region Co-operative Project NC-5, Nutritional Status and Dietary Needs of Population Groups. Representatives from Iowa State College, Kansas State College, Ohio State University and the Bureau of Human Nutrition and Home Economics of the United States Department of Agriculture cooperated in developing the project.

The study of the management problems of the school lunch programs was planned by representatives from the Institution Management Departments of the three cooperating schools and the Bureau of Human Nutrition and Home Economics. The

Institution Management Department of Iowa State College was responsible for the investigation of problems involved in the management and operation of school lunch programs in Iowa.

During the school year of 1948-49, data concerning the management and operation of school lunch programs were collected in 25 Iowa public schools using a schedule recommended by the Bureau of Human Nutrition and Home Economics (25). This research was a part of the Iowa State College Agricultural Experiment Station research project 1021, the Nutritional Status of Iowa School Children: the School Lunch as a Contributing Factor.

## Purpose and Basic Assumptions

The purpose of this part of the study was to investigate problems involved in the management and operation of lunch programs in Iowa schools where a full meal is served. Two assumptions are basic to this aspect of the study: first, there are problems in management, including financial control and food preparation and service; second, a study of existing problems and current trends in school lunch programs can indicate specific needs for efficient management and operation.

## Hypotheses

Certain factors concerning the school lunch can be measured as a basis for determining some problems and trends in the management and operation of lunch programs. Some measures which are used to compare certain management aspects are the amount of labor time scheduled for the school lunch personnel, the space provided for the lunchroom and the costs involved in operating the program. It was assumed that these measures vary among schools according to the number served and the seating capacity of the lunchroom. Because of differences in the school enrollment, location and type of lunchroom supervision, it was recognized that the kind of school might be a factor influencing the management and operation of the lunch program.

The null hypotheses tested were that other than variation attributed to the number of lunches served and the capacity of the lunchroom, there are no differences among three groups of schools, the junior and senior high schools, the elementary schools and the schools having grades one through 12 in :

1. The daily labor time scheduled for school lunch personnel
2. The school lunch kitchen area
3. The school lunch dining room area
4. The dining table area
5. The food, labor, other and total cost of operating the school lunch program

## REVIEW OF LITERATURE

A fact generally accepted is that efficient management is requisite for planning, preparing and serving attractive, palatable and nutritionally adequate school lunches at low cost. To corroborate this fact, surveys of school lunch programs have been conducted to evaluate management methods and relate them to nutritive values, cost and acceptance of the lunches served.

In 1951 Dreisbach and Handy (25) reported an extensive study of school lunch management in 39 schools throughout the country using a schedule developed by the Bureau of Human Nutrition and Home Economics. Since the same schedule was used for collecting the data for the present investigation of the management aspects of Iowa school lunch programs, their study is reviewed in detail. Following a chronological report of other school lunch management surveys, the literature pertaining to labor time, income and expenditures, acceptability of the food served and nutritive value of school meals is reviewed.

### School Lunch Management Surveys

The 39 lunch programs which Dreisbach and Handy (25) investigated during 1946-47 and 1947-48 were in schools

located in rural communities or towns under 2,500 population. Lunches conforming to the Type A pattern, specified by the United States Department of Agriculture, were served in 33 schools; the other six offered menu items in addition to the Type A lunch. In all but three of the schools lunches were served to less than 500 pupils. Visiting each school, the information for the schedule was collected through direct observation and interviews and from school records. Data concerning the number of pupils eating the school lunch, the time required to prepare and serve the lunches, the income and expenditures, the nutritive value of the foods served and the acceptability of the lunches were collected for one day in each school. Information regarding the employees and the organization of work was obtained. A layout of the kitchen showing the placement of equipment and the principal food route traveled by the workers was sketched for each school visited.

Participation in the lunch program was determined by calculating the percentage of enrolled pupils in each school who were served lunch. In the 39 schools studied, participation ranged from 21 to 100 per cent. Whether or not pupils ate the lunch served at school depended upon a variety of factors. The distance between the pupils' homes and the school and the selling price of the lunch seemed to have influenced the participation to some degree. The number of

lunches served free to those unable to pay was not considered a factor affecting percentage participation since relatively few students were certified to receive meals free.

The proportion of employees to the number of lunches served varied considerably in these schools. Some of the 39 schools employed student and volunteer workers in addition to regular full-time and part-time employees. The rate of production in each school was compared by determining both the number of lunches served per man-hour of labor and the minutes of labor expended per lunch. The number of lunches served per man-hour of labor was calculated by dividing the total number of lunches served to all persons on the day observed by the total labor hours involved in food preparation, service, cleaning and other activities. The minutes of labor expended per lunch served were determined by dividing the total labor minutes expended for work and other activities by the number of lunches served. The rate of production ranged from 6 to 16 lunches per man-hour and the labor time expended ranged from 4 to 11 minutes per lunch.

The total hours involved in food preparation, service, cleaning and other work varied extensively according to the number served, the number and kinds of foods served, the size and condition of the kitchen and dining room, the amount and type of equipment available, the efficiency with which the employees worked and the time spent in other activities

such as eating and resting. In most schools more time was spent for cleaning and serving than for preparing food. Where canned foods, mixes and ready-to-eat foods were used, little time was required for preparation. Additional factors affecting the time spent for serving were the type of service, the amount of portioning of food required and the regularity of the flow of students through the serving line during the serving period. In some schools the time spent for cleaning was less because school janitors assisted with the heavier cleaning, especially sweeping and mopping floors.

The training and experience of the workers and the organization of their duties were considered to be important factors influencing the rate of food production and affecting the number of employees required. A majority of the workers were homemakers without formal training in quantity food preparation. Volunteer and pupil workers were employed extensively; they may or may not have had particular ability for school lunch work. In three of the schools dietitians supervised the lunch program. In most of the schools cook-managers, who were responsible for some of the food preparation, managed the lunch program. In the smaller schools the organization of work was usually informal and no work schedules were planned. Where larger numbers were served, the work was organized and specific duties were assigned to the workers.

The location, size and layout of kitchen and dining room space were factors which affected the total amount of labor time required for food preparation and service in the 39 schools. Long and indirect routes to travel in preparing and serving the lunches increased labor time. The school showing the highest records of production had the most adequate equipment for food preparation.

Income and expenditures were calculated for the day observed and for a period of three months or longer. Receipts and costs for the longer period were assumed to be more representative for each school. Receipts represented the money collected for the sale of lunches plus the reimbursement from National School Lunch Program funds. Reimbursement ranged from 5 to 9 cents per pupil in the 39 schools.

Food and labor were the principal items of expense paid from school lunch receipts. Space, janitor service and utilities were provided by the school for most lunch programs. In some schools maintenance and replacement of equipment were paid from school lunch funds. The other minor expenses paid from these funds varied according to individual schools.

Per capita receipts and food and labor costs showed a wide variation among schools. Per capita cash receipts were determined by dividing total school lunch income, in-

cluding reimbursement due for the day, by the total number of lunches served to all persons on the day observed. Per capita income varied somewhat according to the number of free lunches served and the amount of reimbursement allocated. Per capita food cost on the day observed was calculated by determining the monetary value of the food used in preparing each menu item, exclusive of the value of donated commodities, and dividing the total recipe cost by the number of portions prepared. The food cost per lunch was obtained by adding the cost per serving of each food item in the lunch. The amount of donated foods used was responsible to some degree for the variation in food cost among schools.

The per capita labor cost was calculated by dividing labor cost for the day by the total number of lunches served on the day observed. Labor cost represented the pro-rated daily wages plus the food cost of lunches consumed by all employees who received lunch as a part of their remuneration. Labor costs varied from school to school and depended on the number served, the number of workers employed and the prevailing wages in the community.

The total amount of each food returned by the pupils and the number returning each food were recorded for every school. The quantities of unconsumed food varied extensively in each of the 39 schools. Vegetables, vegetable salads and main dishes were the foods most often returned and returned

in greatest quantities. Waste was lowest for fruits, prepared desserts and breads. In 33 schools the amount of plate waste ranged from 5 ounces to 20 pounds per 100 lunches served and averaged 6 pounds. The factors influencing the amount and kind of food returned varied from school to school. The investigators assumed that time spent for food preparation, dislike of certain foods, dissatisfaction with the appearance of the lunch, lack of appetite and limited time for eating lunch were factors affecting the amount and kinds of food returned.

The nutritive value for every menu item served on one day in each of the 39 schools was calculated for food energy and eight nutrients. The total for each nutrient in the quantities of each food item prepared was divided by the total number of meals served to determine the nutrients per serving. These values were totaled to figure the nutritive value of the individual lunches. When these calculated values were compared with one third of the allowances recommended by the National Research Council ( 76 ) for children 10 to 12 years of age, some lunches were deficient in several nutrients. Riboflavin was the only nutrient in which all lunches were completely adequate. Twenty-eight lunches provided one third or more of the required protein; only 13 afforded one third or more of the energy required.

Dreisbach and Handy (25, p. 2) concluded that the

analysis of the findings from the study of 39 school lunch programs indicated "relationships between management practices, and the nutritive value, cost, and acceptance of the lunches."

Similar but not as extensive studies of school lunch management have been conducted by others. During January, 1947, Todhunter and Tucker (109) observed the school lunch program in 28 schools of Mobile City and County, Alabama. A schedule prepared specifically for the study was used to collect the data. The selling price of the lunches varied from 12 to 28 cents and the participation percentage ranged from 30 to 86. In 19 schools less than two thirds of the children and in one school less than one third of the children ate the school lunch. These investigators suggested that when only a small proportion of children eat the school lunch, some searching questions should be asked as to the quality and quantity of the food served, the price of the meal and the cooperation of the teachers and principal with the lunch program.

The study showed that 50 to 90 per cent of the school lunch income was spent for food; the median was 71 per cent. Seventeen to 35 per cent was used to pay wages and 0 to 10 per cent to buy equipment. In some schools as much as 4 per cent of the income was spent for utilities, in others utilities were paid from school funds.

Data concerning the equipment, work schedules, labor time and organization of each school lunch program were obtained. As a result of the study Todhunter and Tucker suggested, among other things, that (109,pp. 189-190):

> 8. A supervisor of the school lunch program should be appointed to guide and assist managers and to coordinate the program. The supervisor should hold the same relationship to the school lunch program as do other supervisors in the school system to their respective areas.
> 9. All school lunch personnel should be specifically trained for the service they are to render in the school program, and this personnel should be employed in the same manner and on the same basis as are other school personnel.
> 10. Short courses and in-service training should be given to present school lunch personnel; training in menu planning, management, food purchasing and record keeping for managers, food preparation for cooks, and dishwashing and sanitation for other helpers.

Kennedy (50) observed factors in the management of school lunch programs in three central Ohio elementary schools in 1949 and used the same schedule and methods for collecting data as did Dreisbach and Handy (25). In this report the data were presented for each individual school. No general conclusions were drawn other than to consider that the results substantiated to a limited degree the suggestion made by Dreisbach and Handy (25) that management practices in school lunch operation are contributing factors in meeting the nutritional needs of children.

To investigate lunch programs in the state of Virginia and determine the various aspects being emphasized, data

were collected by Turner (110) from 39 schools. After reviewing the information obtained by sending a questionnaire to each school, certain recommendations were made for improving the management and operation of the lunch program. More emphasis on providing nutritionally adequate lunches was considered necessary. Since space and equipment were found to be inadequate in many of the schools, the writer suggested that more attention should be given to improving the facilities.

Habig (37) studied various management aspects of school lunch programs in selected Indiana schools. She obtained information on the organization, the management practices, participation of pupils, physical features, financial status, amount of federal commodities and the effect of price on student participation. A questionnaire was sent to 200 selected elementary and high schools which served Type A lunches. Responses were received from 82 per cent of the schools. The number of pupils enrolled in these schools ranged from 90 to 350 and the average percentage of enrolled pupils participating was 71. The investigator concluded that percentage participation is higher in smaller schools and relatively lower as the enrollment increases. Price made little difference in the percentage of enrolled pupils participating in the lunch program. Expenses were found to be similar to amounts recommended in the literature. There

was indication that equipment was needed. The author concluded that this survey provided evidence of a lack of organization in the lunch programs studied.

Lunchroom management and operation of some Ohio schools were studied by Sando and Patton (90). The number of pupils enrolled in these 288 schools which were selected at random varied from 421 to 681 and the reports showed that from 45 to 50 per cent of the children ate in the lunchroom. Percentage participation was highest in the rural schools.

In these Ohio schools the menus for 41 per cent of the school lunch programs receiving federal reimbursement were planned by cooks, 28 per cent by home economics teachers and 10 per cent by lunchroom managers. Teachers, school administrators or school nurses planned menus for the other lunch programs. Thirty-three per cent of the school lunch programs not receiving reimbursement from federal funds were under the supervision of a school lunch manager. Most of these schools were located in larger cities. The majority of lunch programs provided a planned plate lunch; in some schools a few additional items were served. Ten per cent of the schools could not provide lunch for all students desiring to eat in the lunchroom because floor space, dining room equipment and kitchen equipment were limited.

## Labor Time

Bryan (18) stated that the number of school lunch employees and the total hours they worked varied with the volume of business, the type of food served, the labor saving equipment available, the layout of the equipment and the efficiency of the workers. On the basis of reports from 62 schools which served fewer than 500 students, she indicated that approximately one full-time employee for 55 students served was a representative ratio. The figure representing the number of employees for each school was obtained by adding the total working hours of all employees and dividing by eight. The average number of minutes of labor expended per student served in the 62 schools was 8.5.

To compare labor hours expended in the Denton High School Cafeteria with those in other cafeterias in some Texas high schools, Taliaferro (101) adapted Augustine's (5) per meal labor hours for college residence hall food service by excluding the time used for dining room service. These adjusted figures were slightly lower than the average per capita labor hours for Texas high school cafeterias serving 100 or more students:

| Number Served | Augustine's Per Capita Labor Hours | Taliaferro's Per Capita Labor Hours |
|---|---|---|
| 0- 99 | .2089 | .2082 |
| 100-199 | .1635 | .1812 |
| 200-299 | .1384 | .1472 |
| 300-399 | .1192 | .1295 |

The Administration Section of the Western Washington Dietetic Association (132) reported the per meal labor hours for 15 school lunch programs in junior and senior high schools and elementary schools. The number served in these schools ranged from 65 to 253. The average total per meal labor time was 5.88 minutes; per meal times for preparation, service and cleaning were 2.01, 1.95 and 1.92 minutes respectively.

Bryan (18) has suggested that labor time should be divided almost evenly between preparation, service and cleaning. She further stated that (18, p. 120):

> The board of education provides . . . for the cleaning of the room in which the students sit while eating. This cleaning is usually done by the janitor and consists of a daily mopping of the floor and removal of trash and regular cleaning of windows and paint as required. The most satisfactory results are obtained when the responsibility for all cleaning in connection with the food service rests with the manager, and the janitor sets aside a regular amount of time daily in which to do the required cleaning according to the standards set by her. . . . Cleaning of tables in the lunchroom and all counter and kitchen cleaning are done by cafeteria employees.

The United States Bureau of Human Nutrition and Home Economics has suggested methods for increasing the efficiency of the school lunch kitchen in order to decrease labor time as well as labor cost (112, p. 2):

> Efficient arrangement of space and equipment in the school lunch kitchen is of major importance in economical management. By streamlining the layout, it is often possible to make a kitchen more productive with the same number of workers, thus cutting down the cost of labor, which is usually a very substantial item in the total meal cost. . . .

> In large quantity food preparation, the forward movement of food from delivery to service may be compared to the assembly line in a manufacturing plant. A short, direct route that enables workers to prepare and serve meals with the fewest possible steps indicates an efficient kitchen layout. If the route requires much backward or cross travel the layout is wasteful of workers' time and energy. The length of the food-preparation route depends primarily upon (1) size of lunchroom area, (2) arrangement of equipment, (3) location of receiving and storage areas in relation to kitchen, and (4) location of preparation centers with respect to serving unit.

## Income and Expenditures

Efficient management can be an influencing factor in controlling school lunch expenses, particularly food and labor costs which present the largest items of expenditures in school food service. According to West and Wood some factors affecting food cost control are (130, p. 433):

> . . . the menu offered, the type of service, the methods of pricing, the provisions of meals for employees, the purchasing methods, waste, and the size of portions.

Several factors tend to influence the percentage of income spent for labor (130, p. 441):

> . . . the numbers served; the floor plan; the placement of the food preparation units in relation to the serving unit; the kind, amount, and placement of equipment; the experience and skill of workers; the labor turnover; the wage rate; the quality of management; the degree of organization of employees; and the standards of the director.

Income and expenditures of school lunch programs have

been analyzed to compare the amount spent for food and labor and to determine other typical expenses. Other operating expenses which were paid from the total cash income of lunch programs varied extensively from school to school. Bryan (18) found that in schools not receiving federal reimbursement, such income generally was used to pay for food, wages of all employees, replacement of small equipment, ice or other refrigeration, paper and cleaning supplies, laundry and uniform service, fuel, medical examination of employees, office supplies, table decorations and the repair of equipment. In some schools the board of education paid operating expenses other than food and labor. In others reimbursement and donated commodities from the National School Lunch Program made it possible to have sufficient income to defray certain operating expenses and sell lunches at low cost.

The United States Production and Marketing Administration (125) reported that in 1949 the most typical price charged children for a complete lunch served in schools receiving reimbursement was 20 cents. The average cost, however, of all types of school lunches was 25 cents, of which the parents paid 14, the federal government 6, state and local governments 3 and other local groups 2 cents. These figures indicated that without the reimbursement from the National School Lunch Program, the expenses in many schools would have exceeded the income.

When the income from lunches sold to pupils and adults was used as the basis for computing the percentage distribution of expenditures for 22 days in an Iowa rural school with twelve grades, James (46) found that the total of the food and labor expenditures exceeded the income. Bottled gas, soap and paper supplies were other expenses usually paid from this income. When federal reimbursement was included as part of school lunch income, food and labor costs did not exceed the income and other expenses could be paid without excessive net loss.

Brughelli (17) studied certain operating costs and practices in six Pennsylvania school lunch programs during November, 1948. Food, wages, repairs and cleaning and paper supplies were typical items of expense paid from school lunch income, including National School Lunch Program funds. Cook-managers were paid from school lunch income while teachers who were managers of lunch programs were paid from school funds. One school set aside 10 per cent of the school lunch income for equipment replacement. In another water, gas and electricity used for preparing the lunch were paid from school lunch income. Laundry expense for one school and cost of removing garbage for another were defrayed by such income.

Moulton (73) analyzed income and expenditures for a high school cafeteria which provided both a Type A lunch

and an a la carte menu. During the school year of 1945-46, 85 per cent of the income was used for food, labor and a portion of the manager's salary. Laundry, fuel, garbage disposal, repairs and replacement, small equipment, supplies and miscellaneous items were paid from the remaining 15 per cent of the income leaving a small operating surplus. Thirteen per cent of the income included money received for serving other special groups.

Using information provided by questionnaires returned from 62 central Ohio schools and by state records, Waye (129) investigated the food and labor costs of lunch programs receiving federal reimbursement. She found the average costs to be similar to those reported in other studies. Of the total cash income received by all schools from the sale of lunches and federal reimbursement, an average of 94 per cent was used for food and the wages. The ratio of per cent of income spent for food to that paid for labor was 2.7 to 1 as compared to 2.3 to 1 reported by Bryan (18).

## Acceptability of School Lunches

Adequate school meals can be prepared and served, but the food actually consumed may not always meet the nutritional requirements of the pupils. Although appearance, palatability and temperature of the food served influence

the acceptance of food, there are more complex factors involved. Eppright stated that (29, p. 586):

> Food acceptance is a complex reaction influenced by biochemical, physiological, psychological, social, and educational factors. Metabolic conditions play a part. Age, sex, and mental state are factors of importance. People differ greatly in their sensory response to foods.
>
> The food likes and dislikes of the individual move in a framework of race, tradition, economic status, and environmental conditions.
>
> History reveals that changing food habits is usually a slow process. . . .

Adams (1) obtained evidence of food likes and dislikes of pupils in grades four through 12 in a rural Iowa school. A questionnaire was used on which the children checked whether they would eat, would not eat, or had not tasted 101 food items. The results showed that the pupils participating in the study preferred fruits to vegetables. If 75 per cent of the pupils would eat a food, it was considered to be well accepted. More than 75 per cent indicated that they would eat cooked peas, corn, potatoes and string beans and raw carrots, cabbage, lettuce, tomatoes, celery and onions. Poultry, pork, beef and eggs were accepted by 98, 94, 94, and 87 per cent of the children respectively. Eighty-eight per cent of the pupils said they would drink milk and milk drinks and more than 75 per cent would eat all types of breads. Evidence was obtained to show that the pupils in the elementary grades of this school would eat a smaller variety of foods than the older children. Unfamiliarity

with some foods and the method of preparation were influencing factors.

Using a questionnaire similar to the one used by Adams (1), Irving (45) attempted to determine some of the factors that contributed to the acceptance of food by children in grades three through ten in five Iowa schools. Four food groups found to be deficient in the diets of Iowa children were studied: green and yellow vegetables, foods containing ascorbic acid, eggs, milk and milk products. The acceptance of these items was studied in relation to texture and flavor. There was evidence that pupils in the fifth, sixth, seventh and eighth grades would eat fewest of the foods. The findings indicated that (45, p. 40-41):

> . . . boys accept both the food groups and textures and flavors better than the girls, with the exception of mild foods. In the acceptance of the four food groups by both boys and girls, eggs rank first, Vitamin C foods second, green and yellow vegetables third and milk and milk products lowest. With the exception of the third-and fourth-grade group, the acceptance of sweet foods was highest by both boys and girls. More of the third- and fourth-grade boys and girls accepted mild foods than sweet foods. Strong foods were the least accepted by both boys and girls in all grade groups.

Lynn (62) determined the quantity and character of plate waste for 37 days in the University school lunchroom at Ohio State University. Two hundred and forty high school and 126 elementary school pupils participated in the study. Salads, vegetables and meat substitutes were returned in greatest amounts, each within the range of 16.51 to 22.16

per cent of total plate waste. Butter, meat dishes, soups and potatoes returned by the pupils were within 9.67 to 14.45 per cent of the total food returned. Desserts, breads, beverages, preserves and sandwiches were returned in less amounts ranging from 5.10 to 5.91 per cent of the total plate waste.

Amounts of food served to and returned by each pupil in one school lunchroom were weighed during April and October by Boren (13) to determine the extent of plate waste and the nutritive value of the food consumed. An average of 7 per cent of the food served per person was returned. The percentages of the daily nutritional allowances provided by the food served and consumed were compared:

| Nutrients | Per Cent Served | Per Cent Consumed |
|---|---|---|
| Calories | 23- 57 | 21- 56 |
| Protein | 39- 56 | 36- 54 |
| Calcium | 34- 53 | 31- 50 |
| Iron | 24-110 | 23-104 |
| Vitamin A | 34- 58 | 28- 49 |
| Thiamine | 33- 69 | 32- 68 |
| Riboflavin | 33- 54 | 22- 51 |
| Ascorbic Acid | 22-170 | 20-161 |

Potatoes, meats, breads and vegetables were returned in greater amounts in October. Sandwiches, desserts, vegetables, fruits, fruit juices and white potatoes were not accepted as well in April.

Wilson (133) measured the plate waste in ten elementary

school lunch programs in Alabama during the spring and fall of 1948 and the winter of 1949. Plate lunches were served in six schools and a choice of foods was permitted in four. Some of every item served in each school was returned by the pupils. Cooked vegetables accounted for a large portion of the unconsumed food in all schools. Where a choice of food was offered, dairy products were returned in large amounts.

Permitting a choice did not seem to prevent or decrease waste. There was little evidence that season affected the acceptance of food. In an urban school where a selection of menu items was offered, the younger children left more food on their plates than the older children. The investigator believed that several factors influenced the kind and amount of food returned by pupils. Size of serving, unfamiliar items on the menu, over-cooking and excessive seasoning seemed to increase the amount of food not consumed. Attractive, colorful and crisp foods were rarely returned by the pupils.

Data concerning the acceptability of menu items, the nutritive value of the lunches consumed and the factors affecting acceptance of foods were collected in a rural Iowa school by Laughlin (58) from February 23 through May 17, 1948. She reported that in general the children accepted all foods well. Few students in grades seven through

12 returned food while a large percentage of those in grades one through three did not consume all of their lunch. More pupils in grades four through six obtained second portions of food and left less on their plates than those in the lower grades and more than those in the higher grades. Laughlin found that (58, pp. 78-79):

> The students seemed to like sandwiches, main dishes, and desserts best. They accepted vegetables and salads less readily. In general, the meat, fish, and poultry items were accepted by 80 per cent or more of the students. The same was true for sandwiches, meat substitutes, desserts, and milk, except for peanut butter sandwiches, and stewed prunes. The students seemed to prefer the sandwiches with meat to those with cheese or peanut butter. There was 100 per cent acceptance of milk by the individual groups over half of the time. Vegetables and salads were usually accepted by 75 per cent or more of the students, except for Harvard beets, creamed green beans, sweet potatoes, stewed tomatoes and scalloped tomatoes. Irish potatoes were preferred to sweet potatoes.

A study of the nutritional adequacy of the lunches consumed by the three grade groups over a period of four weeks revealed that (58, p. 81):

> . . . the adequacy of the lunches decreased as the recommended dietary allowances increased for the three grade groups. The lunches consumed by the first group were most frequently nutritionally adequate, while those consumed by the third group were least frequently adequate. This may have been due to the fact that the third group often had an inadequate supply of food, and the per cent of students returning for additional servings was small.

In this same study a record was kept of factors which might affect the acceptance of the food served. There was

no apparent effect from changing weather conditions. An epidemic of measles did seem to increase the amount of food returned by the children. The appearance and palatability of the food served during the period of the study was rated by the investigator as good or excellent for all but three items.

Jenkins (47) studied the acceptance of food by 42 pupils in the second, fifth and eighth grades in a public school in Leesburg, Virginia. She found that in the school lunchroom, breads were accepted readily by most of the students. Foods returned by pupils in the order of increasing amounts were desserts, fats, milk, meats, meat substitutes and vegetables.

## Nutritive Value of School Lunches

In general a school lunch is considered adequate if it supplies at least one third of the child's daily nutritional allowances as recommended by the National Research Council (76). To attain such a standard should be the ultimate goal in planning school meals. There are factors involved, however, which can limit the adequacy of the lunches served and consumed. West and Wood have emphasized that (130, p. 23):

> The basic factors in successful institutional meal planning include considerations of the nutritional requirements of the group to be fed and their food habits as influenced by locality, race, and religion; the amount of money to be spent; the availability and seasonability of foods; the employee personnel; and the equipment and other plant resources.

To plan adequate meals, knowledge of the amounts of certain types of foods which need to be used to meet nutritional requirements is essential.

The nutrititive values of some school lunches have been analyzed and studied with reference to the acceptability of the food, the cost, the labor time involved in preparation and service, and to other management aspects.

James (46) analyzed food costs for a rural Iowa school in relation to the nutritive value of lunches served to students for a period of four weeks in April, 1948. In general it was found that the most nutritionally adequate lunches usually were the most expensive. The cost and nutritive content of the food served depended not only on the menu items but on the size of portions (46, pp. 69-79):

> The lunches served to the children in grades 1-3 were nutritionally most adequate, while those served to the students in grades 7-12 tended to be least adequate. . . .
>
> Most of the lunches served the students in grades 7-12, 17 out of 20, were inadequate in protein, while those served the other two groups were adequate in this respect except for two lunches served to grades 4-6. Many of the lunches served grades 1-3 provided an excess of many nutrients over one third of the recommended allowance, whereas the lunches served grades 7-12 often did not meet one third of the allowances. Had the size of servings for the

> students in grades 7-12 increased in proportion to the needs of these students, the lunches would have been more adequate. . . . It is suggested that more standardized portions be served the students.

In the 20 lunches studied, the amount of vitamin A was inadequate more frequently than other nutrients. All lunches were high in ascorbic acid due to the citrus fruit juice, a donated federal commodity.

Stenborn (96) determined the adequacy of the lunches provided in 12 school lunch programs in Colorado. The nutritive values of lunches served on five consecutive days in each school were calculated and compared with one third of the allowances recommended by the National Research Council (76). When averages for the five days were considered, eight of ten nutrients were adequate for 75 to 100 per cent of all schools. Every lunch was deficient in calories and ascorbic acid. Riboflavin and vitamin A were above the recommended amount for every school, while niacin and phosphorous were adequate for all except one. Of a total of 58 lunches studied, only five provided one third of the daily nutritional allowances recommended for the children served.

Meyers and others (69) determined the nutritive value of some school lunches by chemical analyses of the food as well as by calculations from food composition tables. The average values for lunches served on three consecutive days in 15 schools throughout eastern and central United States

were considered representative of the food provided by each school lunch program. When the analyzed and calculated values were compared, there were few differences for food energy, protein, calcium and fat. The average calculated thiamine value was 34 per cent higher than the analyzed; the ascorbic acid value, 57 per cent higher, and the riboflavin, 20 per cent lower. After further study of these and additional school lunches, Velat and others concluded that (127, p. 38):

> Use of calculated rather than analyzed figures for thiamine and ascorbic acid. . . could easily give a false impression of adequacy for the amount of these important vitamins in the meals. The margin of differences between analyzed and calculated values makes it desirable to plan lunches calculated to contain at least one half of the National Research Council's allowances for thiamine and ascorbic acid until better tables are available for values for cooked food.

These investigators found that the average lunch served in a Cumberland, Maryland school provided about one third of the vitamin A, ascorbic acid and calcium in the diets of the children and about one fourth of the food energy, protein, iron, thiamine, riboflavin and niacin.

Dreisbach and Handy (26) studied the nutritive values of both Type A and self-selected lunches in relation to the food cost, labor cost for preparation of the lunches and the selling price in five high schools. They found a wide range from school to school in the food and labor costs for both Type A and self-selected meals. When nutritive

values were compared to recommended allowances, the Type A lunches in most instances were more adequate than the self-selected. A majority of the pupils who purchased the Type A meal paid more than those who selected lunches from a variety of menu items. The self-selected meal, however, provided less food in return for the money spent.

## METHOD OF PROCEDURE

Problems in the management and operation of school lunch programs were investigated in 25 Iowa public schools. These schools represented a sample drawn from all the Iowa public schools where a full meal was served at noon during the school year of 1948-49. A full meal, as the term is used here, refers to a lunch considered to be a complete meal and not a supplement to a lunch brought from home.

### The Sample

The sampling procedure for the regional school lunch project was planned by a representative of the Statistics Department of Iowa State College in cooperation with representatives from each of the three participating states and the Bureau of Human Nutrition and Home Economics.

The name, location, and enrollment of and the number of grades in each public school were obtained from the Iowa Educational Directory and from the records of county superintendents. The name and location of each school receiving federal reimbursement for full meals and for a milk program were provided by the Director of the Iowa School Lunch Program. A questionnaire was mailed to the administrators of

all other schools to determine whether they were operating a school lunch program and if so, the kind of meal served. The schools were classified according to four categories: those lunch programs providing a full meal, supplementary food, no food and those from which no information was available.

Participants planning this research project believed that lunch programs in certain types of schools might present problems typical for those schools. Consequently all schools in each of the four categories described were classified further according to three groups: junior and senior high, elementary and schools having grades one through 12 in one unit. The population of the city or town in which a school was located was also suggested as a factor which might affect various phases of the lunch program and all schools were classified further into categories referred to as population groups. The three population groups represented schools in cities with a population of 50,000 or over, in cities and towns with a population of one to 49,999 and those having grades one through 12 in one unit in rural areas, and rural elementary schools.

The schools for the management study were drawn from the 622 in which full meals were served during the school year of 1948-49. There were no full meals served in rural elementary schools at that time. No schools with grades

one through 12 in one unit were located in cities with a population of 50,000 or over. Hence, schools for the management research were drawn from only five categories as shown in Table 1.

Table 1. Classification, Number and Size of Sample of Iowa Public Schools Serving Full Meals During 1948-49

| Population Groups | School Groups | | | | | |
|---|---|---|---|---|---|---|
| | Junior and Senior High | | Elementary | | Grades 1-12 in One Unit | |
| | Total | Sample | Total | Sample | Total | Sample |
| 1. Schools in cities with a population of 50,000 or over | 26 | 3 | 4 | 3 | 0 | 0 |
| 2. Schools in cities with a population of one to 49,999 and schools having grades one through 12 in one unit in rural areas | 41 | 3 | 26 | 3 | 525 | 13 |
| 3. Rural elementary schools | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 67 | 6 | 30 | 6 | 525 | 13 |

The sample of schools was planned to include three from each category, but since 85 per cent of the total number had grades one through 12 in one unit, the representative from the statistics department suggested that the sample for that category be increased to include 13. The names of all

schools in each of the five categories were arranged alphabetically under the name of the county in which they were located. The names of the counties were arranged in alphabetical order and the schools numbered consecutively. A sample was drawn at random from the schools in each of the five categories using Snedecor's (93) table of random digits.

The director of the State School Lunch Program communicated with the administrators of the 25 schools to explain the purpose of the proposed study and request cooperation with the research project. The administrators of two schools having grades one through 12 in one unit did not wish to take part in the study and the schools were replaced in the sample by drawing two at random from the same category.

The code numbers for each school and the key for determining the school group and the population groups from which each was drawn appear in Appendix A, Table 17. The location in the state of the 25 schools in which management studies were conducted is shown in Appendix A, Figure 6.

In subsequent discussions the junior and senior high schools will be referred to as high schools and the schools having grades one through 12 in one unit will be referred to as schools with 12 grades.

## The Schedule

A Schedule for School Lunch Management Studies, shown in Appendix B, was used for collecting the data in the 25 Iowa public schools. This schedule had been developed and used by the Bureau of Human Nutrition and Home Economics to study school lunch management in relation to nutritive value, cost and acceptance of food served in 39 schools throughout the United States (25). In order to obtain comparable data, the committee planning the management studies in the three cooperating states agreed to use this schedule and permission was granted through the Bureau of Human Nutrition and Home Economics.

The schedule includes seven pages on which to record data. The first three are for information concerning the lunch, the number of people eating in the lunchroom and the amount of food consumed by the pupils. The next two pages are for recording data about the employees and the time expended by individual workers on the day observed. Another page provides space on which to draw to scale a layout of the area and equipment of the kitchen, dining room and storeroom. The last page is a form for recording the financial data for three months or a longer period.

## Pilot Studies

Pilot studies were conducted during the school year of 1947-48 in order to develop methods and procedures and determine the scope of the management research for the state school lunch research project. The pilot studies in Iowa were initiated in the Gilbert Consolidated School. Ninety-four per cent of the pupils were transported to school in busses and approximately 200 of the 228 enrolled pupils were served daily in the school lunchroom.

Laughlin (58) collected data from February 23 through May 17, 1948, to determine the acceptability of the menu items at each of three grade levels, gain information to be used as a guide in planning nutritionally adequate and acceptable meals, secure information regarding plate waste and compare recommended dietary allowances.

James (46) collected data concurrently with Laughlin from April 1 to May 14, 1948, to analyze the distribution of expenditures, relate the food cost of the lunches to their nutritional adequacy, compare the cost of food served with the income and determine to what extent federal commodities aid the school lunch program.

Augustine and others (6) reported the general conclusions drawn from these two pilot studies. Differences found in the nutritional adequacy of the lunches served and

consumed indicated that plate waste should be considered when evaluating a school lunch. Vegetables and salads were accepted less readily than other menu items. This may account in part for the general deficiency in vitamin A of the lunches consumed. There were differences in the nutritional adequacy of the lunches served to pupils in grades one through three, four through six and seven through 12, showing a need for standardization of portions of food for the pupils in various grade groups in relation to their respective nutritional requirements. There seemed to be some direct relationship between the cost of lunches and the nutritional adequacy.

The results of these pilot studies indicated the importance of the contribution of federal commodities and reimbursement. The average per capita value of federal commodities used in this school was approximately 4 cents and represented about one fifth of the total monetary value of the food used. With this value of the commodities and the reimbursement of 6 cents per pupil, the federal aid amounted to an average of 10 cents per capita which was 50 per cent of the amount paid by a pupil for one lunch.

During May, 1948, additional pilot studies were initiated to develop techniques for collecting and recording the data and determine the time necessary for one person to obtain in each school the essential information. Using the

schedule approved for this research, data were collected on three consecutive days in the Gilbert Consolidated School. The schedule was tested on one day in a senior high school in Des Moines where 700 students were served the school lunch.

These pilot studies showed that two days were required to obtain the information necessary to complete the schedule in any one school. The data were secured by interviews, direct observation and from school records. Testing the schedule evidenced a need for assistance in the larger schools to tabulate the number of pupils returning each kind of food.

The data obtained from the schools in which these pilot studies were conducted appear in the tables with the data obtained from the 25 schools in the state sample but are not included in the analyses.

## Collecting the Data

The 25 schools in the sample were visited during the period from October, 1948, through May, 1949.

Pilot studies in the two schools had indicated the advisability of being at a school all day preceding the day on which specific data were to be collected in order to make arrangements with the administrator and the school lunch

manager and to observe the workers and the general organization of work for preparing and serving the lunch. Some administrators and lunch supervisors believed that the number of persons eating the school lunch on Wednesday was usually representative of the average although variation could be expected. Data were collected, therefore, in each school on Tuesday and Wednesday.

Before visiting a school, the administrator was contacted and a date selected. Days preceding or following school vacations were avoided as well as any day on which special school events were being held. An attempt was made to collect data in each school on a Wednesday which the administrator considered typical for the operation of the school and the lunch program.

Upon arrival at a school on Tuesday morning, a prearranged conference was held with the administrator of the school unit in which the lunchroom was located to explain the plans for collecting the data and obtain necessary information for carrying out the plans. Before lunch was served, a brief conference was held with the person who managed the lunch program to tell her of the purpose of the study. Details concerning the research were discussed after observing the lunch service. At the latter conference the general work schedule for each employee was obtained; this was used as a guide for recording the labor time on

Wednesday. The menu for Wednesday, the recipes and cost of food were recorded then, if available.

The layout of the kitchen, dining room and storeroom including the equipment was drawn on Tuesday afternoon following the completion of work in those areas.

On Wednesday the time expended by individual workers was recorded from the time each employee started work until her work for the day was completed. All data concerning the lunch were recorded. In the larger schools pupils, teachers or employees assisted during the time students were returning unconsumed food.

In all but two of the schools, the same scale was used for weighing the food prepared, served and returned. Similar scales were furnished by these two schools when the mode of travel prevented transporting the scales usually used.

Before leaving the school, there was a final conference with the school administrator to secure information concerning the financial policies of the lunch program and to obtain other data not previously acquired.

The lunch

Information regarding the amount paid by children and adults for the lunch and the amount of federal reimbursement received by the school were obtained from the administrator.

The menu and recipes for Wednesday's lunch were provided

by the manager or the head cook. Weights recorded for each menu item were: every ingredient used in preparation, the total amount prepared, the amount served to pupils and the total amount served.

In the elementary schools and the schools with 12 grades individual portions of each menu item representative of those served to the pupils in the sixth grade were weighed. In the high schools the food items in a lunch representative of the average served to pupils were weighed. All weights were recorded in ounces or the nearest fraction.

Two high schools in the sample were not receiving federal reimbursement and did not provide a Type A lunch. In one of these schools a similar type of lunch was offered in addition to other items from which pupils could choose. There was no lunch combination offered in the other high school cafeteria; the personnel, when planning the menu, assumed that a certain combination of foods would be selected by approximately 100 students. The students choosing these lunches in the two schools were counted as they passed through the cafeteria line. The selling prices of the plate lunch in the one school and of the combination in the other school were obtained from the managers and used to compare with the cost of the Type A lunches served in other schools in the sample. The information concerning the plate lunch and the special combination selected in these two schools

was recorded on page one of the schedule.

The cost of all foods used in preparing and serving the lunches in each school was secured from purchase records and delivery slips. If these were not available in the smaller schools, the information was obtained from the stores where the foods had been purchased. The value of donated commodities was estimated on the basis of the cost of the food to a school if purchased from a wholesale or retail distributor. Dried eggs, non-fat dry milk powder and concentrated orange juice were not available in quantities in most of the smaller communities of Iowa during 1948 and 1949. The probable cost of these items was furnished by wholesale distributors of these products.

Counts were made at three different intervals during a period when students were being served at a consistent rate of speed without any periods of waiting. The average of these three counts was recorded on the schedule as the number of students served per minute at the peak of service.

Participation in the lunch

The enrollment of the school was obtained from the superintendent or the principal and represented the number of pupils attending the school at the time the study was being conducted.

Those in charge of the operation of the lunch program

in each school kept daily records of the number and types of meals served. They furnished the necessary information regarding the number of meals served to pupils and adults who paid, to pupils unable to pay and to regular full-time and part-time employees, volunteer workers, student employees and guests.

Pupils bringing lunches from home were counted as they entered the lunchroom. In a few schools students ate their lunches in rooms other than the lunchroom and unless some of the school personnel knew the number bringing lunch, that information was not available.

The number of pupils and others buying milk only was taken from records kept in each school which sold milk as a supplement to lunches brought from home.

Acceptability of food served

The appearance and flavor of each food item served were evaluated subjectively by assigning scores ranging from five to one. The reason for giving a menu item a low score was recorded.

The weight of food served to the students was determined by first weighing the total amount of each menu item prepared. Then the total weight of each food on the menu served to teachers and other school personnel and the weight of each food item left after all persons had been served were

deducted from the weight of each food item prepared. The difference constituted the weight of the food served to the students.

The total weight of each food returned and the number of pupils who returned each food were recorded. Containers for every food item on the menu were placed on the scraping table. A school lunch employee, teacher or student advised the pupils to scrape each food returned into the container marked for that menu item. The food in each container was weighed after all plates had been returned.

The workers and their duties

Information was obtained about each person receiving remuneration from the school lunch program, including managers, regular full-time employees, part-time employees, pupils and volunteer workers. Supervisors in charge of all lunch programs in a city school system or home economics teachers who helped with the management of the school lunch were not included as employees unless a portion or all of their salary was supplied from school lunch income.

The name of each worker, the hours scheduled for each to work and the amount of wages, training and experience were furnished by either the school administrator, lunch supervisor or the manager. The manager or in some instances the employees described the duties of the workers.

Flow of work

The actual time expended by individual workers on each work operation throughout the day was recorded in minutes and fractions of minutes. Work operations were classified as preparation, service, cleaning and other work; time spent eating, resting and waiting was also noted. Each activity for every employee was described in enough detail to ascertain the total hours each worker expended, the division of her work throughout the day and the total amount of time spent for the preparation of each food item.

In order to determine the amount of time expended for the preparation of each item on Wednesday's menu, the time spent on Tuesday in advanced preparation for that menu was also recorded. If food for Thursday was being prepared on Wednesday, that work was not considered as a part of the time expended for work on the day the data were being collected.

The length of time each piece of power equipment was used and the capacity utilized were not recorded for this study.

Layout of space and equipment

The kitchen, storeroom and dining room area were measured and a layout of the space was drawn using a scale

of one fourth inch to one foot. All equipment was measured and sketched into the plan according to the scale used. The principal routes traveled by the workers in preparing and serving the lunch were indicated on the layout. The distance between the kitchen and storeroom was included in the route traveled by the workers regardless of the location of the storeroom. The size, capacity and type of all equipment in the kitchen and dining room were described.

Financial records for the day observed and for the school year

Information concerning the cash receipts for the day were obtained from the manager or the person responsible for preparing the financial reports. If possible the receipts for lunches were recorded on the schedule separately from those for milk only, candy or ice cream.

The actual cost of the food for the day observed was recorded with information about the lunch. The daily wages were included with the data regarding the workers. The smaller schools recorded few other expenses and did not usually work out a financial statement for each day. The larger schools prepared daily financial reports which included pro-rated operating expenses. The income and expenses for the day for each school were recorded and analyzed.

The administrator supplied information concerning the general items of expense which were paid from school lunch

income. He indicated whether food cost reported on the yearly financial records represented cost of food purchased or of that used and whether cost of employees' meals and amount paid for Iowa Old Age and Survivors Insurance were included as labor expense.

The financial records of 22 lunch programs for the school year of 1948-49 were examined. Three of the 25 schools in the sample failed to make a report for that year. The information about the schools receiving federal reimbursement was obtained from the files in the office of the Iowa School Lunch Program. The schools not receiving reimbursement were visited at the close of the school year and the administrators made the financial records available for analysis.

Data taken from the yearly records included the number of days the lunchroom operated, the number and types of lunches served and to whom they were served. Cash receipts for lunches, ice cream, candy, milk and banquet service were recorded separately if possible. Any cash contributions received during the year were listed as additional income. Federal reimbursement was included in cash receipts. The food expenditures were itemized when possible as food for lunches, food for banquets and other special functions, milk sold separately, ice cream and candy. Other expenses recorded were wages and cost of repairs and replacement of

equipment. The remaining minor expenses were classified as other expenses since there was a wide range of items included for the various schools.

Using the information obtained from records and from the school administrators, income and expenditures for each school for the day observed and for the school year were analyzed. In these analyses food cost represented the value of the food consumed during the period analyzed exclusive of the value of donated commodities and minus the cost of the food served to employees. The cost of employees' meals was determined by dividing the cost of the food consumed by the total number of lunches served. This per capita food cost was multiplied by the number of employees who ate lunch to find the total cost of employees' meals. Labor costs included the amount of wages paid, the amount paid from the school lunch income for Iowa Old Age and Survivors Insurance and the cost of employees' meals. Other expenses included all others paid from school lunch funds. Surplus or loss for the day and for the year and the percentage distribution of expenditures were determined on the bases of the analyses described.

Organization and management of the school lunch program

Information regarding each school and certain aspects of the organization and management of the lunch program

were recorded but not tabulated. This information is included in Appendix C for reference when interpreting the data.

## FINDINGS AND DISCUSSION

Information regarding the management and operation of school lunch programs was obtained from 25 Iowa schools during the school year of 1948-49. Data concerning the number of persons participating in the lunch program, the amount of labor time involved in preparing and serving the lunch, the factors affecting labor time, the income and expenditures, and the acceptability and nutritive value of the lunches served were analyzed.

For each management aspect studied, data and averages for the entire group of 25 schools are described first. Then the findings and averages for each of the three groups of schools are presented and compared in this sequence: the high schools, the elementary schools and the schools with 12 grades. The data are discussed with reference to other school lunch studies and to accepted standards. Although the information obtained from the pilot studies in Schools 230 and 110 is tabulated with these data, it is not included in the analyses.

The code number for each school and the key for determining the school groups and the population groups from which each was drawn appear in Appendix A, Table 17.

## Participation in the School Lunch Program

According to Dreisbach and Handy (25, p. 8) participation "refers to pupils and adults taking part in the lunch program by eating the school lunch." The number of pupils and adults participating in the lunch programs in the Iowa schools studied appears in Table 2. The total number of lunches served represented all pupils and adults, including workers, who ate the lunch on the day observed. Lunches served to pupils who were unable to pay were classified as "free." The percentage of total enrolled pupils who were participating was calculated using the number of all pupils eating the school lunch; those paying for the lunch, eating free lunches and those receiving lunch as remuneration for working in the lunchroom were included.

Revenue lunches served on the day observed refers to all lunches served to customers, including those who received free lunches and excluding all student and adult workers. The daily average number of revenue lunches for the school year 1948-49 was determined by dividing the total number of revenue lunches served during the school year by the number of days the school lunch was operated. The number of revenue lunches served was used as the basis for calculating the per capita receipts, costs, labor time and certain per capita space allowances. This use of the number

Table 2. Pupil and Adult Participation in the Sch

| School | Total Lunches Served | Lunches Served on Day Observed | | | | | |
|---|---|---|---|---|---|---|---|
| | | Pupil Participation | | | | | |
| | | Total Enrolled Pupils Participating | | Pupils Eating | | | Total |
| | | | | Type A Lunch | Type A Lunch Except Milk | Other Foods | |
| | No. | % | No. | No. | No. | No. | No. |
| 230 | 210 | 75.3 | 186 | 186 | 0 | 0 | 24 |
| | 239 | 85.8 | 212 | 212 | 0 | 0 | 27 |
| | 222 | 80.1 | 198 | 198 | 0 | 0 | 24 |
| 110 | 712 | 45.2 | 673 | 0 | 0 | 673 | 39 |
| 111 | 214 | 19.6 | 177 | 159 | 2 | 16 | 37 |
| 112 | 137 | 9.7 | 114 | 110 | 4 | 0 | 23 |
| 113 | 515 | 34.4 | 481 | 0 | 0 | 481 | 34 |
| 121 | 108 | 18.7 | 93 | 93 | 0 | 0 | 15 |
| 122 | 227 | 31.3 | 203 | 203 | 0 | 0 | 24 |
| 123 | 286 | 27.3 | 244 | 244 | 0 | 0 | 42 |
| 211 | 87 | 15.6 | 69 | 69 | 0 | 0 | 18 |
| 212 | 504 | 69.6 | 471 | 0 | 0 | 471 | 33 |
| 213 | 148 | 13.1 | 135 | 135 | 0 | 0 | 13 |
| 221 | 117 | 54.2 | 109 | 109 | 0 | 0 | 8 |
| 222 | 85 | 21.4 | 77 | 77 | 0 | 0 | 8 |
| 223 | 158 | 17.7 | 141 | 141 | 0 | 0 | 17 |
| 231 | 112 | 93.2 | 96 | 96 | 0 | 0 | 16 |
| 232 | 97 | 73.6 | 84 | 78 | 6 | 0 | 13 |
| 233 | 213 | 54.8 | 194 | 178 | 16 | 0 | 19 |
| 234 | 271 | 87.8 | 251 | 203 | 48 | 0 | 20 |
| 235 | 211 | 83.3 | 195 | 164 | 31 | 0 | 16 |
| 236 | 150 | 82.8 | 135 | 115 | 20 | 0 | 15 |
| 237 | 127 | 50.4 | 117 | 84 | 33 | 0 | 10 |
| 238 | 227 | 52.4 | 223 | 223 | 0 | 0 | 4 |
| 239 | -[a] | - | - | - | - | - | - |
| 2310 | 140 | 96.3 | 130 | 123 | 7 | 0 | 10 |
| 2311 | 132 | 96.0 | 119 | 119 | 0 | 0 | 13 |
| 2312 | 216 | 70.6 | 195 | 190 | 5 | 0 | 21 |
| 2313 | 186 | 76.8 | 173 | 142 | 31 | 0 | 13 |

[a]Not possible to return the second day to obtain data, number of lunches served

[b]Represents an estimate by the superintendent, no yearly report made.

[c]Not available, no central place for eating lunches brought from home.

rticipation in the School Lunch Program in 26 Iowa Schools

| bserved | | Adult Participation | | Pupils Bringing Home Packed Lunches | | Revenue Lunches | |
|---|---|---|---|---|---|---|---|
| ng | | | | | | | |
| Other Foods | Total | Teachers Eating | Workers and Others Eating | Total | Buying Milk in Lunch Room | Served on Day Observed | Daily Average for 1948-49 |
| No. | No. | No. | No. | No. | No. | No. | No. |
| 0 | 24 | 11 | 13 | 13 | 0 | 206 | 229 |
| 0 | 27 | 14 | 13 | 13 | 0 | 235 | |
| 0 | 24 | 13 | 11 | 13 | 0 | 218 | |
| 673 | 39 | 26 | 13 | -[c] | 80 | 701 | 704 |
| 16 | 37 | 27 | 10 | 136 | 116 | 205 | 216 |
| 0 | 23 | 21 | 2 | 228 | 7 | 127 | 128 |
| 481 | 34 | 23 | 11 | 375 | 13 | 505 | 513 |
| 0 | 15 | 12 | 3 | -[c] | 19 | 100 | 100 |
| 0 | 24 | 17 | 7 | 55 | 48 | 223 | 291 |
| 0 | 42 | 39 | 3 | 500 | 0 | 278 | 366 |
| 0 | 18 | 12 | 6 | 103 | 125 | 68 | 132 |
| 471 | 33 | 29 | 4 | 176 | 46 | 473 | 351 |
| 0 | 13 | 8 | 5 | 100 | 0 | 136 | 137 |
| 0 | 8 | 5 | 3 | 35 | 10 | 115 | 108 |
| 0 | 8 | 4 | 4 | 12 | 0 | 82 | 154 |
| 0 | 17 | 13 | 4 | -[c] | 0 | 150 | 101 |
| 0 | 16 | 11 | 5 | 6 | 5 | 107 | 130 |
| 0 | 13 | 7 | 6 | 0 | 0 | 93 | 102 |
| 0 | 19 | 15 | 4 | 63 | 16 | 209 | 208 |
| 0 | 20 | 14 | 6 | 0 | 0 | 266 | 271 |
| 0 | 16 | 12 | 4 | 8 | 0 | 203 | 200 |
| 0 | 15 | 9 | 6 | -[c] | 0 | 147 | 154 |
| 0 | 10 | 7 | 3 | 7 | 0 | 121 | 160 |
| 0 | 4 | 0 | 4 | 31 | 0 | 221 | 231 |
| - | - | - | - | - | - | 89 | 89 |
| 0 | 10 | 6 | 4 | 3 | 0 | 137 | 120 |
| 0 | 13 | 9 | 4 | 0 | 0 | 129 | 130[b] |
| 0 | 21 | 13 | 8 | 21 | 3 | 207 | 254 |
| 0 | 13 | 10 | 3 | 25 | 0 | 176 | 177 |

er of lunches served is the daily average for April.

port made.

from home.

of persons served and accommodated by the regular service and dining room facilities is similar to the method used by Augustine (5) for converting cost and labor time to a per capita basis.

To determine whether the number served on the day observed was typical for a school, that number was compared with the daily average number of revenue lunches for the year. In 14 schools there was little difference between the two figures. In eight schools the daily average number of revenue lunches for the year was considerably higher than was the number served on the day observed. These schools were visited on warm sunny days and the school lunch personnel indicated that more pupils and adults than usual had gone home or to restaurants for lunch. In three schools the daily average number of revenue lunches for the year was appreciably lower than the number served on the days observed. Two of these schools were visited on days when more students than usual ate lunch at school presumably because of the inclement weather. The total of the daily averages for the year was 256 more than the total number of revenue lunches served in 24 schools on the day observed.

Participation percentages reported by other investigators are summarized in Table 3 and compared to the findings of the present research. There was wide variation in the number of schools studied. These figures show averages of

Table 3. Per Cent of Total Enrolled Pupils Eating Lunch Served at School

| Study | Location | Number of Schools | Per Cent of Enrolled Pupils Eating the School Lunch | |
|---|---|---|---|---|
| | | | Average | Range |
| Donaldson | Iowa | | | |
| High schools | | 6 | 25.7 | 9.7- 69.6 |
| Elementary schools | | 6 | 25.3 | 17.7- 54.2 |
| Schools with 12 grades | | 12 | 70.9 | 50.4- 96.3 |
| Total schools | | 24 | 36.4 | 9.7- 96.3 |
| Dreisbach and Handy (25) | | | | |
| All types of schools | United States | 39 | 63.0 | 21.0-100.0 |
| Todhunter and Tucker (109) | | | | |
| All types of schools | Alabama | 28 | - | 30.0- 86.0 |
| Kennedy (50) | | | | |
| Elementary schools | Ohio | 3 | - | 34.8- 86.0 |
| Sando and Patton (90) | | | | |
| All types of schools | Ohio | 288 | 45-50 | - |
| Habig (37) | | | | |
| Elementary and high schools | Indiana | 165 | 71.0 | - |
| Waye (129) | | | | |
| All types of schools | Ohio | 62 | 52.0 | 19.8-100.0 |
| Taliaferro (101) | | | | |
| High schools serving | Texas | | | |
| 300-399 | | 2 | 46.8 | - |
| 200-299 | | 4 | 38.5 | - |
| 100-199 | | 4 | 19.5 | - |
| 0- 99 | | 4 | 12.5 | - |
| 60 | | 1 | 8.0 | - |

daily participation in a number of schools for one day. There seem to be factors specific for different groups of schools which affect the percentage of enrolled pupils eating the school lunch. A large proportion of enrolled students eating lunch at school was one of the criteria for selecting the schools observed by Dreisbach and Handy (25). The 288 schools studied by Sando and Patton (90) represented a random sample.

The average percentage of enrolled pupils participating was lower for the 24 Iowa schools than for the other schools investigated except for one school. Participation in the lunch programs in the rural schools having 12 grades was approximately the same as the highest percentage which was reported by Habig (37). The average percentage and the range in percentages for the high and elementary schools were lower than for other schools reporting comparable figures.

Thirty-six per cent of the pupils enrolled in 24 Iowa schools ate lunch served at school. The percentage participation in the individual schools ranged from 9.7 to 96.3. Average participation in the schools with 12 grades was 70.9 per cent and the range was from 50.4 to 96.3 for the individual schools. In the high schools and the elementary schools 25.7 and 25.3 per cent of the enrolled pupils ate

the lunch. Participation in the individual schools ranged from 9.7 to 69.6 per cent and 17.7 to 54.2 per cent. The proportion of pupils eating the school lunch in the Iowa schools having 12 grades was more than twice that of either the high schools or the elementary schools. The schools with 12 grades were located in towns or communities with less than 1,000 population or in rural areas. The number of pupils enrolled in these schools ranged from 103 to 425. The elementary and high schools were located in cities or towns with more than 5,000 population and the number enrolled in these schools ranged from 201 to 1,400.

Of the pupils who attended the schools in smaller towns and rural areas, most of those not eating the school lunch went home. Only .58 per cent of the pupils enrolled in these 12 schools brought lunch from home whereas 1.99 and 1.77 per cent of those in the high and elementary schools brought lunch. School personnel in some high and elementary schools where larger numbers of pupils brought lunch, reported that a majority of these pupils believed they could not afford to pay for the school lunch. Many of the students in the schools located in larger cities and towns went home for lunch and some went to nearby restaurants.

The effect of the selling price on the number of pupils buying the lunch would be difficult to determine for so small

a sample of Iowa schools. The per cent participation is shown in relation to selling price:

| Selling Price of Lunch | Number of Schools | Average Per Cent Participating |
|---|---|---|
| $ .16 | 1 | 96.3 |
| .18 | 1 | 21.4 |
| .20 | 8 | 61.5 |
| .25 | 10 | 28.2 |
| .30 | 2 | 14.1 |
| a la carte | 2 | 45.9 |

The selling price ranged from 16 to 30 cents and was lowest in the school where the greatest per cent of enrolled pupils were eating the lunch and was highest in the school with the lowest per cent of pupils participating. The per cent of participation in the 10 schools charging 25 cents for lunch ranged from the second lowest to the second highest.

Of the 3,141 Type A lunches served in 21 schools on the day observed, 3.67 per cent were free. Of the total number of Type A lunches served in these schools during the school year of 1948-49, 6.24 per cent were free. Dreisbach (25) found that of 8,751 Type A lunches served in 33 schools, 4 per cent were free. The United States Production and Marketing Administration (125) reported that 14.8 per cent of the Type A meals served in all schools receiving federal reimbursement during 1948-49 were free.

No attempt was made to determine factors influencing the participation of teachers, employees and other adults.

The 432 lunches served to adults in 24 schools represented 9.25 per cent of all meals served on the days observed. The per cents of adults eating lunch in the high schools, elementary schools and the schools with 12 grades were 10, 10 and 8.2 respectively.

The information obtained with the schedule used and the number of schools included in the present study were too limited to determine all of the factors which influenced the number of pupils and adults eating lunch in any one school or groups of schools.

## Statistical Analyses

The amount of labor time scheduled for school lunch personnel, the space provided for the lunch program and the costs involved in operating the program were compared to determine whether there were differences among the three groups of schools studied. Analyses of variance of the labor time scheduled, the kitchen area provided and the food, labor, other and total costs expended per revenue lunch served and the dining room area and the table space per seat in the dining room indicated few real differences between the three groups of schools. Some of these data were used for estimating the number of schools to include in a sample for further management studies.

To determine whether there were differences which could be attributed to factors other than variation in the number of lunches served or the seating capacity of the dining room, analyses of covariance were computed for each of the measures.

Estimating sample size

For each of the three groups of schools variances were calculated for: the per lunch labor time scheduled; the per lunch kitchen area; the per seat dining and table area and the per lunch food, labor, other and total costs for the school year 1948-49. For the size of the sample to be estimated, a t value of 2 was taken as an appropriate value for determining 95 per cent confidence limits and one half widths of the desired confidence intervals were selected for each of the measures. The size of the sample was estimated using the formulas:

$$n_o = \frac{t^2 s^2}{d^2} \quad \text{and} \quad n = \frac{n_o}{1 + \frac{n_o}{N}} \quad .^{1}$$

For the measures analyzed, data are provided in Appendix E, Table 21 which can be used as a guide for determining the size of a sample based on the total number of schools in

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[1] W. G. Cochran. Sample Survey Techniques. North Carolina State College, Raleigh, N. C. Mimeo. Series no. 7. 1948. p. 13.

each of the three groups. To estimate sample size, use the formula

$$n = \frac{n_o}{1 + \frac{n_o}{N}};$$

let N equal the number of schools in the population to be sampled. The n, indicated in Table 21, was based on the number in each of the three groups of Iowa schools where full meals were served during the school year 1948-49.

Analyses of covariance

To test the hypotheses, an analysis of covariance was computed for each of the following measures which were used as the Y variable: the total daily labor time scheduled for school lunch personnel; the school lunch kitchen area; the school lunch dining room area; the dining table area; the food, labor, other and total costs of operating the lunch program during the school year of 1948-49. For the labor time and kitchen area, the average daily number of revenue lunches served was used as the X variable. For the dining room and table area the number of seats in the dining room was used as the X variable. For the costs the total number of revenue lunches served during the school year of 1948-49 was used as the X variable. (See Appendix E, Tables 22 through 29.)

To determine the significance of the adjusted means,

the F test was applied (93). When each of the Y variables was adjusted to the X variable indicated, the analyses of covariance showed that for the three groups of Iowa schools studied, the high schools, the elementary schools and the schools with 12 grades, there were real differences in:

1. The amount of labor time scheduled for the school lunch personnel
2. The kitchen area
3. The dining table area
4. The labor, other and total costs of operating the school lunch program.

It was interesting to note that when food costs for the year were adjusted to a common mean number of revenue lunches served, differences between the three groups of schools were not significant. There were no real differences between the three groups of schools in the dining room area when the means were adjusted to a common number of seats in the dining room.

These findings will be referred to in subsequent discussions of the various management aspects analyzed.

## Labor Time in Relation to the Number of Lunches Served

The number and type of employees, the total daily labor time scheduled and the time expended for preparing the menu

and serving the food on the day observed are shown in Table 4. The total daily labor time scheduled represented the total hours which, according to the school records, the employees were expected to work. The total daily labor time for the menu on the day observed included all the time required for preparing the food for the menu observed, and for serving, cleaning, other work, resting and eating on the day the data were collected.

In 15 of 24 schools the total labor time scheduled for the workers was less than the total daily labor time for the menu on the day observed. This difference is partially attributed to the fact that time used for preparing food on Tuesday for Wednesday's menu was included in the total labor time for the day observed; any time required on Wednesday for preparing food for Thursday was excluded. In addition some personnel worked longer than the scheduled time. The kinds of food to be prepared on the day observed influenced the amount of time required for labor.

Knowing the amount of labor time required for preparing and serving a school lunch on one day and the number of lunches served on that day, the rate of production in different schools can be compared. Production can be measured by determining the number of lunches prepared and served per man-hour of labor or the number of minutes of labor time expended per lunch served. The rate of the service

Table 4. Number of Workers, Total Daily Labor Time, and Rate of Produc

| School | Number of Workers | | | | Total Daily Labo | | | |
|---|---|---|---|---|---|---|---|---|
| | Full-Time | Part-Time | | | Scheduled | For Menu Observed | Adult Wo | |
| | | Regular | Pupils | Volunteer | | | Paid - | |
| | No. | No. | No. | No. | Hr. Min. | Hr. Min. | No. | Hr. Min. |
| 230 | 4 | 0 | 0 | 2 | 24 - 0 | 25 - 29.00 | 4 | 24 - 17.00 |
| | 4 | 0 | 0 | 1 | | 19 - 35.50 | 4 | 18 - 7.50 |
| | 4 | 0 | 0 | 1 | | 23 - 38.00 | 4 | 22 - 9.00 |
| 110 | 9 | 0 | 10 | 0 | 80 - 20 | 93 - 35.00 | 9 | 75 - 17.00 |
| 111 | 3 | 6 | 0 | 0 | 33 - 30 | 41 - 25.75 | 9 | 41 - 25.75 |
| 112 | 1 | 1 | 22 | 0 | 30 - 30 | 24 - 2.75 | 2 | 7 - 21.75 |
| 113 | 5 | 0 | 9 | 0 | 49 - 0 | 47 - 48.50 | 5 | 37 - 39.00 |
| 121 | 1 | 1 | 6 | 1 | 16 - 30 | 22 - 20.00 | 2 | 14 - 38.00 |
| 122 | 2 | 2 | 0 | 0 | 21 - 0 | 20 - 9.50 | 4 | 20 - 9.50 |
| 123 | 3 | 0 | 5 | 0 | 29 - 0 | 27 - 26.25 | 3 | 22 - 26.25 |
| 211 | 3 | 0 | 13 | 0 | 20 - 40 | 26 - 10.00 | 3 | 15 - 18.50 |
| 212 | 3 | 0 | 28 | 0 | 49 - 0 | 48 - 21.50 | 3 | 20 - 58.50 |
| 213 | 2 | 1 | 11 | 0 | 21 - 50 | 21 - 35.00 | 3 | 14 - 41.00 |
| 221 | 2 | 0 | 0 | 0 | 13 - 0 | 13 - 33.50 | 2 | 13 - 33.50 |
| 222 | 1 | 1 | 0 | 0 | 8 - 35 | 10 - 0 | 2 | 10 - 0 |
| 223 | 2 | 0 | 5 | 0 | 17 - 15 | 18 - 19.00 | 2 | 15 - 0 |
| 231 | 2 | 0 | 0 | 1 | 12 - 30 | 15 - 45.50 | 2 | 15 - 8.50 |
| 232 | 2 | 1 | 1 | 0 | 14 - 30 | 15 - 20.50 | 3 | 14 - 40.50 |
| 233 | 2 | 1 | 1 | 0 | 15 - 30 | 18 - 54.00 | 3 | 18 - 54.00 |
| 234 | 5 | 0 | 0 | 1 | 35 - 0 | 36 - 8.50 | 5 | 35 - 47.50 |
| 235 | 3 | 0 | 4 | 0 | 24 - 30 | 24 - 10.50 | 3 | 17 - 27.50 |
| 236 | 2 | 0 | 0 | 3 | 17 - 0 | 18 - 13.50 | 2 | 14 - 45.50 |
| 237 | 2 | 0 | 4 | 0 | 21 - 0 | 22 - 43.50 | 2 | 16 - 30.50 |
| 238 | 4 | 0 | 3 | 0 | 21 - 0 | 22 - 41.75 | 4 | 19 - 39.75 |
| 239 | 2 | 0 | 2 | 0 | 13 - 0 | - | - | - |
| 2310 | 3 | 0 | 0 | 0 | 15 - 0 | 16 - 15.00 | 3 | 16 - 15.00 |
| 2311 | 2 | 0 | 0 | 1 | 18 - 0 | 19 - 18.00 | 2 | 13 - 33.00 |
| 2312 | 3 | 0 | 5 | 0 | 23 - 40 | 23 - 52.75 | 3 | 21 - 14.25 |
| 2313 | 2 | 0 | 8 | 0 | 17 - 0 | 20 - 5.50 | 2 | 13 - 49.50 |

[a]Volunteer workers, all other pupil workers were paid cash or given lunch.

[b]Two serving lines.

e, and Rate of Production and Service in 26 Schools on the Day Observed

| Total Daily Labor Time | | | | | | | | | Lunches Per Man-Hour of Labor | Labor Time Per Lunch | Lunches Served Per Minute Per Line |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Adult Workers | | | | | Pupil Workers | | | | | |
| | Paid | | | Volunteer | | | | | | | |
| . | No. | Hr. | Min. | No. | Hr. | Min. | No. | Hr. | Min. | No. | Min. | No. |
| 00 | 4 | 24 - | 17.00 | 1 | 0 - | 57 | 1[a] | 0 - | 15.0 | 8.1 | 7.4 | 11 |
| 50 | 4 | 18 - | 7.50 | 1 | 1 - | 28 | 0 | 0 - | 0 | 12.0 | 5.0 | 12 |
| 00 | 4 | 22 - | 9.00 | 1 | 1 - | 29 | 0 | 0 - | 0 | 9.2 | 6.5 | 12 |
| 00 | 9 | 75 - | 17.00 | 0 | 0 - | 0 | 10 | 18 - | 18.0 | 7.5 | 8.0 | 12[b] |
| 75 | 9 | 41 - | 25.75 | 0 | 0 - | 0 | 0 | 0 - | 0 | 4.9 | 12.1 | 6[b] |
| 75 | 2 | 7 - | 21.75 | 0 | 0 - | 0 | 22 | 16 - | 41.0 | 5.3 | 11.3 | 8 |
| 50 | 5 | 37 - | 39.00 | 0 | 0 - | 0 | 9 | 10 - | 9.5 | 10.6 | 5.7 | 7[b] |
| 00 | 2 | 14 - | 38.00 | 1 | 1 - | 30 | 6 | 6 - | 12.0 | 4.5 | 13.4 | 7 |
| 50 | 4 | 20 - | 9.50 | 0 | 0 - | 0 | 0 | 0 - | 0 | 10.5 | 5.4 | 12 |
| 25 | 3 | 22 - | 26.25 | 0 | 0 - | 0 | 5 | 5 - | 0 | 10.1 | 5.9 | 12 |
| 00 | 3 | 15 - | 18.50 | 0 | 0 - | 0 | 13 | 10 - | 51.5 | 2.6 | 23.1 | 7[b] |
| 50 | 3 | 20 - | 58.50 | 0 | 0 - | 0 | 28 | 27 - | 23.0 | 9.8 | 6.1 | 6[b] |
| 00 | 3 | 14 - | 41.00 | 0 | 0 - | 0 | 11 | 6 - | 54.0 | 6.3 | 9.5 | 6[b] |
| 50 | 2 | 13 - | 33.50 | 0 | 0 - | 0 | 0 | 0 - | 0 | 8.5 | 7.0 | 8 |
| | 2 | 10 - | 0 | 0 | 0 - | 0 | 0 | 0 - | 0 | 8.2 | 7.3 | 7 |
| 00 | 2 | 15 - | 0 | 0 | 0 - | 0 | 5 | 3 - | 19.0 | 8.2 | 7.3 | 7 |
| 50 | 2 | 15 - | 8.50 | 1 | 0 - | 37.0 | 0 | 0 - | 0 | 6.8 | 8.8 | 10 |
| 50 | 3 | 14 - | 40.50 | 0 | 0 - | 0 | 1 | 0 - | 40.0 | 6.1 | 9.9 | 7 |
| 00 | 3 | 18 - | 54.00 | 0 | 0 - | 0 | 1 | 0 - | 59.0 | 11.1 | 5.4 | 5 |
| 50 | 5 | 35 - | 47.50 | 1 | 0 - | 21.0 | 0 | 0 - | 0 | 7.4 | 8.2 | 7[b] |
| 50 | 3 | 17 - | 27.50 | 0 | 0 - | 0 | 4 | 6 - | 43.0 | 8.4 | 7.1 | 7 |
| 50 | 2 | 14 - | 45.50 | 5 | 3 - | 28.0 | 0 | 0 - | 0 | 8.1 | 7.4 | 7 |
| 50 | 2 | 16 - | 30.50 | 0 | 0 - | 0 | 4 | 6 - | 13.0 | 5.3 | 11.3 | 6 |
| 75 | 4 | 19 - | 39.75 | 0 | 0 - | 0 | 3 | 3 - | 2.0 | 9.7 | 7.2 | 8 |
| | - | | - | - | | - | - | | - | - | - | - |
| 00 | 3 | 16 - | 15.00 | 0 | 0 - | 0 | 0 | 0 - | 0 | 8.4 | 7.1 | 7 |
| 00 | 2 | 13 - | 33.00 | 1 | 5 - | 45.0 | 0 | 0 - | 0 | 6.7 | 9.0 | 7 |
| 75 | 3 | 21 - | 14.25 | 0 | 0 - | 0 | 5 | 2 - | 38.5 | 8.7 | 6.9 | 6 |
| 50 | 2 | 13 - | 49.50 | 0 | 0 - | 0 | 8 | 6 - | 16.0 | 8.8 | 6.8 | 7 |

given lunch.

can be evaluated by counting the lunches served per minute in each serving line.

Lunches served per man-hour of labor

The number of lunches served per man-hour of labor in each school was calculated by dividing the number of revenue lunches served by the total hours of labor time required for preparing and serving the menu on the day observed.

The average number of revenue lunches served per man-hour of labor in 24 schools was 7.9 and the range was from 2.6 to 11.1 for the individual schools. (See Table 4.) In the high schools the average number of lunches served per man-hour was 7.2 as compared to 8.0 and 8.3 for the elementary schools and schools with 12 grades. Less than one half of the usual number of students ate lunch in School 211 on the day observed. This accounted for the wide range in the number of lunches served in the high schools and in part for the lower average for this group of schools. Excluding the data for School 211, the number of lunches served per man-hour of labor ranged from 4.9 to 10.6, 4.5 to 10.5 and 5.3 to 11.1 for the high schools, the elementary schools and the schools with 12 grades.

Dreisbach and Handy (25) found that the average number of lunches served per man-hour for 39 schools was 9.3 and the range was from 6 to 16 for the individual schools. These

figures would be expected to be slightly higher than for the findings of the present study since the investigators determined the number of lunches served per man-hour of labor on the basis of the total number of meals served on the day observed rather than on the number of revenue lunches served as was used in the present research.

Bryan (18) suggested that in lunchrooms where less than 500 meals were served daily, there should be 55 lunches prepared and served per 8 man-hours of labor. For the 24 Iowa schools there was an average of 63 revenue lunches served per 8 man-hours of labor.

The average number of lunches per man-hour of labor for schools using full-time employees only, those employing both regular full-time and part-time workers and those having student workers in addition to regular full-time and part-time adult workers differed slightly:

| Number of Schools | Type of Employees | Average Number of Lunches per Man-Hour of Labor |
|---|---|---|
| 6 | Regular full-time | 6.7 |
| 3 | Regular full- and part-time | 7.5 |
| 15 | Regular full- and part-time and students | 7.9 |

Employing part-time workers during the period when preparation and service was at the peak load may have been one factor responsible for the slightly higher production rates

in the schools using part-time and student workers in addition to regular full-time employees.

Minutes of labor time expended per lunch served

Analysis of covariance indicated that when the daily labor time scheduled for the school lunch personnel in 25 Iowa schools was adjusted to a common mean number of average daily lunches served, differences between the three groups of schools were highly significant. (See Appendix E, Table 22.)

As previously described, the labor time used in some schools on the day observed exceeded the amount of labor time scheduled. The average per meal labor time scheduled for each of the three groups of schools and for 24 schools is compared to the average per meal labor time used for the day observed:

| Schools | Per Meal Labor Time Scheduled | Per Meal Labor Time Used |
|---|---|---|
| High schools | 8.3 | 8.4 |
| Elementary schools | 5.6 | 7.0 |
| Schools with 12 grades | 6.3 | 7.2 |
| Total schools | 6.7 | 7.5 |

The number of minutes of labor time expended per lunch served in each school was calculated by dividing the total number of minutes of the total daily labor time for the

menu on the day observed by the number of revenue lunches served on that day.

The average number of minutes of labor time per lunch served in 24 schools was 7.5 and the range was from 5.4 to 23.1 in the individual schools. (See Table 4.) In the high schools the average number of minutes of labor expended per lunch was 8.4 as compared to 7.0 and 7.2 in the elementary schools and schools with 12 grades. In School 211, where less than one half of the usual number of students ate the school lunch on the day observed, the number of minutes of labor expended per lunch was considerably higher than for the other schools. Excluding the data for that school, the number of minutes of labor required per lunch served ranged from 5.7 to 12.1, 5.4 to 13.4 and 5.4 to 11.3 for the high schools, elementary schools and schools with 12 grades respectively.

The average number of minutes of labor time expended per meal for each of the three groups of schools and for the 24 schools are compared in Table 5 with the per meal labor time reported by other investigators. The number of minutes expended per lunch served ranged from 4 to 11 in the 39 schools studied by Dreisbach and Handy (25). Since they determined the per meal labor time on the basis of total number of lunches served rather than on the number of revenue lunches served, the time would be presumably less than that

reported in the present research. The per meal labor time for the high schools coincided with the time reported by Moulton (73) and Bryan (18). Taliaferro (101) classified the schools according to the number of lunches served and reported per capita labor time for four groups of schools

Table 5. Per Meal Labor Time Expended for Preparing and Serving School Lunches

| Study | Number of Schools | Number Served | Per Meal Labor Min. |
|---|---|---|---|
| Donaldson | | | |
| High schools | 6 | 68-505 | 8.4 |
| Elementary schools | 6 | 82-278 | 7.0 |
| Schools with 12 grades | 12 | 89-266 | 7.2 |
| Total schools | 24 | 68-505 | 7.5 |
| Dreisbach and Handy (25) | 39 | 77-810 | 7.0 |
| Taliaferro (101) | | | |
| High schools | 1 | 60 | 9.5 |
| | 4 | 1- 99 | 12.5 |
| | 4 | 100-199 | 10.9 |
| | 4 | 200-299 | 8.8 |
| | 2 | 300-399 | 7.8 |
| Moulton (73) | | | |
| High school | 1 | 175 | 8.5 |
| Bryan (18) | 62 | Less than 500 | 8.5 |

and one high school in Denton, Texas. The number of meals served is generally recognized as a factor which influences the per meal labor time. Three of the schools studied by Dreisbach and Handy (25) served more than 500 lunches, where-

as the remainder of the schools reported in other studies served 505 lunches or less.

Lunches served per meal per serving line

The average number of lunches served per minute per serving line at the peak load of service in 24 Iowa schools was 7.2 and the range was from 5 to 12. (See Table 4.) In five high schools and one school with 12 grades food was served from two cafeteria lines. Bryan (18) stated that it was possible to serve plate lunches including a beverage and dessert to 12 to 15 pupils per minute. Dreisbach and Handy (25) found that the number of lunches served per minute per serving line in 17 schools ranged from 5 to 16.

The findings of the present research were similar to those of other studies. Other factors being equal, deviation above the average number of lunches per man-hour of labor and the average number of lunches served per minute per serving line or below the average number of minutes of labor time per lunch served should indicate efficiency in the rate of production and service. These criteria, however, should not be used alone as measurements of efficiency without an understanding of and an appreciation for other factors such as the division of labor time, the amount of space and layout of the kitchen and dining room, the training and experience of the workers and the organization of the work,

all of which might influence the rate of production and service.

## Division of Labor Time

The division of labor time has been referred to as a factor affecting the rate of production and service in school lunchrooms. To determine the division of labor time in the schools studied and compare the labor time for the three groups of schools, the total span of daily labor time for all employees was divided into time for preparation, service, cleaning, other work and other.

Labor time for preparation included the time involved in food production for the menu observed: time for assembling materials and equipment; measuring, weighing and mixing ingredients; sorting, cleaning, trimming and cutting foods; making salads and sandwiches and cooking other foods; portioning food if done during preparation; moving food from one preparation center to another; refrigerating or storing food during preparation and prior to serving time and putting away unused ingredients.

Service included the time spent for serving the meals: time for assembling and arranging dishes, silverware, trays, napkins, straws and other service equipment; setting up the serving counter; moving food from the refrigerator, store-

room, range or work center to the serving area; portioning those foods not portioned during the preparation period; putting food on plates and into other individual dishes; returning food to the kitchen for reheating between shifts and replenishing the serving counter with food.

Cleaning included the time used for cleaning and maintaining the lunchroom facilities: time for clearing the serving counter and storing left-over food; scraping and stacking soiled dishes; washing, drying and storing dishes, silverware, glassware, trays, pots, pans and other utensils; wiping table tops; cleaning work surfaces, range, refrigerator and other equipment; sweeping and cleaning floors and replacing furniture and equipment after cleaning.

Included as other work was the time spent for writing menus, ordering food and other supplies, checking deliveries, giving directions to workers, taking inventory, preparing records and carrying supplies to and from the storeroom. Time used for resting, waiting, drinking coffee and eating meals was classified as other.

The division of labor time in hours and minutes and the percentage distribution of labor time in relation to the per meal labor time for each of 24 schools on the day observed are shown in Table 6.

There was wide variation among the 24 schools in the division of labor time on the day observed. More labor time

Table 6. Division and Percentage Distribution of Labor Time and P

| School | Division of Labor Time | | | | | Percentage Distribution o | | |
|---|---|---|---|---|---|---|---|---|
| | Preparation | Service | Cleaning | Other[a] Work | Other[b] | Preparation | Service | Cleanin |
| | Hr. Min. | Hr. Min. | Hr. Min. | Hr. Min. | Hr. Min. | % | % | % |
| 230 | 12-49.00 | 2-47.00 | 8-48.00 | 0-10.0 | 0-55.0 | 50.30 | 10.92 | 34.5 |
| | 6-36.00 | 2-48.50 | 6-25.00 | 0- 0 | 1-46.0 | 33.69 | 24.54 | 32.7 |
| | 9-40.50 | 3-43.00 | 8- 2.50 | 0-32.0 | 1-40.0 | 40.94 | 15.73 | 34.0 |
| 110 | 27-49.50 | 32-24.00 | 26-31.00 | 2-19.0 | 4-31.5 | 29.73 | 34.61 | 28.3 |
| 111 | 12- .50 | 11-30.50 | 12-24.75 | 0-56.0 | 4-34.0 | 28.99 | 27.78 | 29.9 |
| 112 | 8-46.25 | 4-27.25 | 8-40.25 | 1-51.5 | 0-17.5 | 36.48 | 18.52 | 36.0 |
| 113 | 7-59.50 | 14-44.50 | 17- 3.50 | 3-24.0 | 4-37.0 | 16.72 | 30.83 | 35.6 |
| 121 | 6-37.00 | 4-25.00 | 5-51.00 | 2- 1.0 | 3-26.5 | 29.63 | 19.78 | 26.1 |
| 122 | 5- 6.50 | 4-17.00 | 7-52.00 | 0-40.0 | 2-14.0 | 25.34 | 21.25 | 39.0 |
| 123 | 10- 1.25 | 3-36.75 | 10-28.50 | 1-14.5 | 2- 5.3 | 36.52 | 13.17 | 38.1 |
| 211 | 6-37.00 | 6-49.50 | 12-16.50 | 0- 0 | 1-27.0 | 21.47 | 26.08 | 46.9 |
| 212 | 12- 0.00 | 16-13.00 | 18-34.00 | 0- 0 | 1-17.5 | 24.82 | 34.12 | 38.3 |
| 213 | 6-19.00 | 4-29.00 | 7-28.75 | 2-11.25 | 2- 7.0 | 24.63 | 20.77 | 34.6 |
| 221 | 4-27.50 | 1-22.00 | 5- 4.00 | 0- 1.0 | 2-39.0 | 32.88 | 10.08 | 37.3 |
| 222 | 3- 3.25 | 2-25.50 | 3-38.25 | 0- 0 | 0-33.0 | 30.54 | 24.25 | 39.7 |
| 223 | 3-35.50 | 5-14.00 | 7-50.50 | 0- 0 | 1-39.0 | 19.61 | 28.57 | 42.8 |
| 231 | 8-45.50 | 3-31.00 | 3- 9.00 | 0- 0 | 0-20.0 | 55.58 | 22.32 | 19.9 |
| 232 | 5-14.50 | 2-33.75 | 5-39.25 | 1- 6.0 | 0-47.0 | 34.17 | 16.70 | 36.8 |
| 233 | 9-27.00 | 1-55.25 | 5- 3.75 | 0-25.0 | 2- 3.0 | 50.00 | 10.16 | 26.7 |
| 234 | 12-57.50 | 7-47.00 | 10-57.00 | 1-47.0 | 2- 4.0 | 35.85 | 21.54 | 30.3 |
| 235 | 9- .50 | 3-35.00 | 10-24.00 | 0- 0 | 1-11.0 | 37.26 | 14.82 | 43.0 |
| 236 | 9- 2.50 | 3-46.00 | 4-44.00 | 0- 0 | 0-41.0 | 49.61 | 20.67 | 25.9 |
| 237 | 8-26.75 | 3-12.50 | 9-52.25 | 0- 0 | 1-12.0 | 37.16 | 14.12 | 43.4 |
| 238 | 8- 2.0 | 4-54.50 | 8-27.25 | 0- 2.0 | 1-16.0 | 35.39 | 21.63 | 37.2 |
| 239 | - | - | - | - | - | - | - | - |
| 2310 | 5- 4.1 | 3-55.25 | 4-34.75 | 0- 2.0 | 2- 2.0 | 34.97 | 24.13 | 28.1 |
| 2311 | 7-16.5 | 4-36.50 | 5-33.50 | 0- 0 | 1-51.5 | 37.69 | 23.88 | 28.8 |
| 2312 | 9-13.0 | 5-34.00 | 7-47.25 | 0- 0 | 1-18.5 | 38.60 | 23.31 | 32.0 |
| 2313 | 8-31.0 | 4- 7.00 | 5-47.50 | 0- 0 | 1-40.0 | 42.39 | 20.49 | 28.8 |

[a]Includes time spent for planning menus, ordering food and supplies, checking delive supplies to and from the store room.

[b]Includes times spent for resting, waiting, drinking coffee, eating lunch.

bor Time and Per Meal Labor Time in 26 Iowa Schools on the Day Observed

| Distribution of Labor Time | | | | Per Capita Labor Time | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| vice | Cleaning | Other[a] Work | Other[b] | Preparation | Service | Cleaning | Other[a] Work | Total Labor | Other[b] | Total |
| % | % | % | % | Min. | Min. | Min. | Min. | Min. | Min. | Min. |
| 10.92 | 34.53 | .65 | 3.60 | 3.7 | .8 | 2.6 | .04 | 7.14 | .27 | 7.4 |
| 24.54 | 32.75 | 0 | 9.02 | 1.7 | 1.2 | 1.6 | 0 | 4.50 | .45 | 5.0 |
| 15.73 | 34.03 | 2.25 | 7.05 | 2.7 | 1.0 | 2.2 | .15 | 6.05 | .46 | 6.5 |
| 34.61 | 28.34 | 2.48 | 4.84 | 2.4 | 2.8 | 2.2 | .20 | 7.60 | .39 | 8.0 |
| 27.78 | 29.96 | 2.25 | 11.02 | 3.5 | 3.4 | 3.6 | .27 | 10.77 | 1.34 | 12.1 |
| 18.52 | 36.06 | 7.73 | 1.21 | 4.1 | 2.1 | 4.1 | .88 | 11.18 | .14 | 11.3 |
| 10.83 | 35.68 | 7.11 | 9.66 | .9 | 1.8 | 2.0 | .40 | 5.10 | .55 | 5.7 |
| 19.78 | 26.19 | 9.03 | 15.37 | 4.0 | 2.6 | 3.5 | 1.21 | 11.31 | 2.06 | 13.4 |
| 21.25 | 39.02 | 3.31 | 11.08 | 1.4 | 1.1 | 2.1 | .18 | 4.78 | .60 | 5.4 |
| 13.17 | 38.18 | 4.53 | 7.60 | 2.1 | .8 | 2.3 | .27 | 5.47 | .45 | 5.9 |
| 26.08 | 46.91 | 0 | 5.54 | 5.0 | 6.0 | 10.8 | 0 | 21.80 | 1.28 | 23.1 |
| 14.12 | 38.39 | 0 | 2.67 | 1.5 | 2.1 | 2.3 | 0 | 5.90 | .16 | 6.1 |
| 20.77 | 34.65 | 10.14 | 9.81 | 2.3 | 2.0 | 3.3 | .96 | 8.56 | .93 | 9.5 |
| 20.08 | 37.37 | .12 | 19.55 | 2.3 | .7 | 2.6 | .01 | 5.61 | 1.38 | 7.0 |
| 14.25 | 39.71 | 0 | 5.50 | 2.2 | 1.8 | 2.9 | 0 | 6.90 | .40 | 7.3 |
| 18.57 | 42.81 | 0 | 9.01 | 1.4 | 2.1 | 3.1 | 0 | 6.60 | .66 | 7.3 |
| 12.32 | 19.99 | 0 | 2.11 | 4.9 | 2.0 | 1.7 | 0 | 8.60 | .19 | 8.8 |
| 16.70 | 36.85 | 7.17 | 5.11 | 3.4 | 1.6 | 3.7 | .7 | 9.41 | .51 | 9.9 |
| 20.16 | 26.79 | 2.20 | 10.85 | 2.7 | .5 | 1.5 | .12 | 4.82 | .59 | 5.4 |
| 11.54 | 30.30 | 4.93 | 7.38 | 2.9 | 1.8 | 2.5 | .40 | 7.60 | .60 | 8.2 |
| 14.82 | 43.03 | 0 | 4.89 | 2.7 | 1.0 | 3.1 | 0 | 6.80 | .35 | 7.1 |
| 20.67 | 25.97 | 0 | 3.75 | 3.7 | 1.5 | 1.9 | 0 | 7.10 | .28 | 7.4 |
| 14.12 | 43.44 | 0 | 5.28 | 4.2 | 1.6 | 4.9 | 0 | 10.70 | .59 | 11.3 |
| 11.63 | 37.26 | .14 | 5.58 | 2.2 | 1.3 | 3.3 | .01 | 6.81 | .34 | 7.2 |
| - | - | - | - | - | - | - | - | - | - | - |
| 14.13 | 28.18 | .21 | 12.51 | 2.5 | 1.7 | 2.0 | .01 | 6.30 | .89 | 7.1 |
| 13.88 | 28.80 | 0 | 9.63 | 3.4 | 2.1 | 2.6 | 0 | 8.10 | .86 | 9.0 |
| 13.31 | 32.61 | 0 | 5.48 | 2.7 | 1.6 | 2.3 | 0 | 6.60 | .38 | 6.9 |
| 10.49 | 28.83 | 0 | 8.29 | 2.9 | 1.4 | 2.0 | 0 | 6.30 | .57 | 6.8 |

cking deliveries, supervising other workers, taking inventory, preparing records, carrying

h.

was spent for serving the lunch than for preparing food in three high schools and in one elementary school. More time was used for cleaning than for food preparation in 14 of the schools, five high, five elementary and four schools with 12 grades. Dreisbach and Handy (25) found that in seven of 26 schools more time was expended for service than for food preparation and in 21 of 26 schools more time was spent for cleaning than for preparation.

The average percentage distribution of total labor time expended for preparation, service, cleaning, other work and resting and eating on the day observed for the three groups of schools and for all of the schools appear in Table 7. The average proportion of labor time spent for preparation and service varied between the three groups of schools, whereas that used for cleaning did not vary to a great extent. The average time for the schools with 12 grades was approximately 4 per cent lower than the averages for both the high schools and elementary schools. The percentage distribution of total labor time for 24 schools showed that approximately one third of the time was used for food preparation, one third for cleaning and one fifth for serving. According to Bryan (18) the labor time should be divided almost equally between preparation, service and cleaning. The Western Washington Dietetic Association (132) found that per meal labor time spent for preparation, service and

cleaning was approximately the same; the time used for preparation was less than .5 per cent more than for service and cleaning.

A discussion of the division of labor time for each of the three groups of schools is presented. The three groups are compared with reference to the percentage distribution of the time expended.

Table 7. Average Percentage Distribution of Labor Time for Three Groups of Iowa Schools

| Division of Labor Time | High Schools | Elementary Schools | Schools with 12 Grades | Total Schools |
|---|---|---|---|---|
| Preparation | 25.44 | 29.47 | 40.04 | 32.62 |
| Service | 27.59 | 19.15 | 19.59 | 22.44 |
| Cleaning | 36.20 | 36.53 | 32.51 | 34.64 |
| Other Work | 3.98 | 3.51 | 1.35 | 2.75 |
| Total Work | 93.21 | 88.69 | 93.49 | 92.45 |
| Other | 6.79 | 11.31 | 6.51 | 7.55 |

In the six high schools the greatest average percentage of labor time was spent for cleaning. More time was spent for service than for preparation. An average of a lower proportion of time was used for food preparation in these schools than in each of the other two groups of schools yet more food items were prepared and served in the high schools. The average number of menu items offered in the six schools was 12.6, of these 9.6 items were prepared in the kitchen.

In two of the schools in the group 20 and 32 a la carte menu items were offered; several of the 16 items prepared in these lunchrooms involved a minimum of labor time. (See Appendix D, Table 20.) The fact that four high school kitchens were equipped with electric food mixers and two with power vegetable peelers might have accounted in part for the lower percentage of preparation time.

The average percentage of time used for service was greater in the six high schools than in the other two groups of schools; having more menu items to arrange on the counter and to serve might have accounted in part for this. In five schools there were two serving lines which required more personnel during the serving period. In the cafeteria in School 212 a greater proportion of time was spent for service than in the other 23 schools studied. There were two cafeteria lines and 32 menu items were offered.

The average percentage of time expended for cleaning in the high schools was similar to that for the other two groups of schools. In general the school lunch personnel were required to do fewer special cleaning jobs than those in the other groups of schools. The special cleaning duties required of school lunch personnel in each school are indicated in Table 8. In two schools the workers were expected to clean the storeroom, in three the kitchen floors.

The lunches in most of the high schools were served

Table 8. Special Cleaning Duties Required of School Lunch Personnel in 27 Iowa Schools

| School | Total Number | Kitchen Equipment | Kitchen Floor | Dining Room Floor | Dining Room Tables | Store Room |
|---|---|---|---|---|---|---|
| 230 | 5 | x | x | x | x | x |
| 110 | 4 | x | x | | x | x |
| 111 | 4 | x | x | | x | x |
| 112 | 2 | x | | | | x |
| 113 | 2 | x | | | x | |
| 121 | 4 | x | x | | x | x |
| 122 | 4 | x | x | | x | x |
| 123 | 4 | x | x | | x | x |
| 211 | 1 | x | | | | |
| 212 | 2 | x | | | x | |
| 213 | 3 | x | x | | x | |
| 221 | 4 | x | x | | x | x |
| 222 | 5 | x | x | x | x | x |
| 223 | 5 | x | x | x | x | x |
| 231 | 3 | x | x | | x | |
| 232 | 5 | x | x | x | x | x |
| 233 | 4 | x | x | | x | x |
| 234 | 5 | x | x | x | x | x |
| 235 | 3 | x | x | | x | |
| 236 | 2 | x | | | x | |
| 237 | 3 | x | x | | x | |
| 238 | 2 | x | | | x | |
| 239 | 5 | x | x | x | x | x |
| 2310 | 4 | x | x | | x | x |
| 2311 | 4 | x | x | x | x | |
| 2312 | 4 | x | x | | x | x |
| 2313 | 3 | x | | x | x | |

on trays while lunches in the other two groups of schools were usually served on divided plates. Cleaning the trays in addition to dishes increased the time for cleaning. These schools had more adequate equipment for food preparation and in four school lunch kitchens there were dishwashing machines. While using such equipment decreased the food preparation and dishwashing time, the care and cleaning of this special equipment might have accounted in part for the larger proportion of time expended for cleaning. Food was served from two lines in five of the schools in this group. The serving counters in Schools 111, 113 and 212 included steam tables and refrigerated units which involved additional labor time for cleaning.

Students scraped plates and washed dishes in five high schools. On the day observed the personnel in three lunchrooms were assigned special weekly cleaning jobs. In School 211, where a greater proportion of time was used for cleaning than in the other 23 schools, thirteen per cent of the time was spent for cleaning the lunch trays. In this school students were responsible for washing the dishes and cleaning the dishwashing machine. The regular full-time employees were responsible for cleaning only the kitchen equipment and there was no dining room. (See Table 8.) They were, however, responsible for the care of the home economics laboratory equipment since the school lunch

equipment was in the same laboratory.

Because the managers of the lunch programs in the high schools had more responsibility for preparing financial reports and for supervising the workers, the average proportion of time spent for other work was higher than in the elementary schools and the schools with 12 grades. In Schools 211 and 212, where no time was used for other work, preparing financial records and ordering supplies were responsibilities of the home economics teachers who managed the lunch programs and therefore the time was not included.

The amount of time spent for eating and resting in the high schools varied with the amount of time scheduled or used in each school for meals and rest periods. In Schools 111, 113, 211 and 213 one half hour was scheduled for the employees to eat lunch before the students were served. In Schools 111 and 113 an additional fifteen minutes were scheduled in the morning for a rest period. In the other schools, where a specific lunch period was not scheduled, there were no planned rest periods and most of the workers ate lunch after the students had been served. The proportion of other labor time was lowest in School 212 where a class of high school students prepared and served the lunch. Each student worked one hour and the cook who supervised the students had no scheduled time for resting.

In the six elementary schools the greatest average per-

centage of labor time was expended for cleaning. More time was spent for preparation than for service. The average number of menu items served in these schools was 6.5, of these 4.5 were prepared in the school lunch kitchen. Mixing machines were used for food preparation in three of the six elementary schools. In general smaller portions of foods and foods requiring little preparation time were prepared. (See Appendix D, Table 20.)

The elementary schools had the lowest average percentage of labor time used for service. Lunch was served from a counter which included a steam table and a cold unit in only two, Schools 122 and 123. In all other schools of this group food was served from temporary serving units, either a built-in counter or a table which required little time for arranging for service. In each of the schools in this group only one menu was offered and one serving line operated. In School 221, where the percentage of time spent for cleaning was the lowest of 24 schools, the employees worked quickly and efficiently. Only three food items required portioning during service, the food was all served on one plate and little consideration was given to the arrangement.

In the elementary schools the average number of special cleaning jobs required of the personnel was more than for the other two groups of schools. (See Table 8.) In the kitchens the type and condition of the equipment was

such that more time was necessary for cleaning. There were electric food mixers in three kitchens and an electric dish-washing machine in one. The equipment in two schools was old and the condition of the floors and table tops made it necessary to spend a greater proportion of time for cleaning. In School 223 where more than twice the amount of time was used for cleaning than for preparation, the serving unit was some distance from the kitchen and more time was required for clearing and cleaning the counter after service. The cooks in this school had exceptionally high standards for cleaning and each day a portion of their time was scheduled for special cleaning.

The average percentage of time used for other work in the elementary schools was almost twice the amount used in the schools with 12 grades. In five of the elementary schools the personnel were responsible for preparing daily financial records and supervising other personnel.

The average proportion of time spent for resting, waiting, drinking coffee and eating was considerably more for the elementary schools than for the other two groups of schools. In School 221, where almost one fifth of the total labor time was spent for eating, resting and waiting, the employees were required to stay on duty a specific number of hours. The two employees worked with considerable speed and efficiency; when the preparation of the lunch was completed

they rested until the scheduled serving time. After lunch was served, the workers rested before washing dishes and completing other work.

The average percentage of time spent for food preparation in the schools with 12 grades was double that for serving and approximately one third more than that for cleaning. The average number of menu items served was 6.9 and prepared was 5.6. None of these school lunch kitchens was equipped with electric mixing machines, vegetable peelers or dishwashing machines and rarely were ready-to-eat foods or mixes used. The amount of time spent for preparing food in School 231 on the day observed was 55.58 per cent of the total labor time. Of the six menu items served, only four were prepared in the kitchen. (See Table 9.) The employees worked slowly and a great proportion of the time was used for peeling and washing potatoes and carrots and for cleaning and chopping cabbage. The two employees rotated duties weekly, preparing food one week and serving and cleaning the next week.

In the schools with 12 grades one fifth of the labor time was spent for service. In only one school was food served from two counters simultaneously. Most of the serving units were tables or counters and very little time was required for arranging the food. In School 233 the percentage of time used for serving was lowest for the 12 schools of this group and second lowest for the 24 schools.

Only 10 per cent of the labor time was expended for service. The workers arranged the serving counter efficiently and planned the service carefully before the serving period started; portions were standardized. Some of the food was portioned during preparation. Time spent for preparation on the day observed was the second highest for the 24 schools. The items prepared were creamed potatoes, spam, peanut butter sandwiches, buttered carrots and spice cake, which required considerable time for preparation.

Approximately one third of the average amount of labor time was expended for cleaning in the schools with 12 grades. Included in this group were five of the eight schools in which the school lunch personnel were required to clean the dining room floors. (See Table 8.) In school 231, where the greatest proportion of time was used for preparation, the smallest percentage of time was spent for cleaning. The school lunch personnel was not required to clean the dining room and there was a minimum of equipment to clean. The lunches were served on divided plates and these were air dried after being rinsed in a tank of heated water. Milk bottles were not washed at the school. All employees left work as soon as the preparation, service and cleaning for the day were completed.

A greater percentage of time was spent for cleaning in School 237 than in the other schools with 12 grades. The

personnel spent considerable time each day scrubbing the kitchen floor which was difficult to maintain in good condition. The condition and type of some of the tables and work counters increased the amount of time required for cleaning.

Few of the school lunch cook-managers in the schools having 12 grades were responsible for preparing financial reports and supervising the work of others. This could account in part for the low average percentage of time spent for other work. In some of the schools the personnel did not order supplies and school janitors carried supplies from the storerooms to the kitchens.

There was considerable variation in the time spent for eating, resting and waiting in the schools having 12 grades. The workers ate lunch and rested at times convenient for them, usually after lunch was served to the students; some of the personnel spent little or no time for eating.

The proportion of time spent for preparation, service, cleaning and other work in 24 Iowa schools varied according to the organization of work, the number and kind of food items served, the condition of the kitchen and the dining room, the amount and type of equipment available, the time spent in supervising work, preparing financial reports and time for eating and resting. Another factor influencing the

cleaning time was the number of special cleaning duties required of the school lunch personnel. That other factors are involved in the percentage distribution of labor time and the rate of production and service in school lunch programs is recognized.

## Other Factors Affecting Labor Time

The size of the kitchen and dining room, the length of the basic food route and the training and experience of the workers have been suggested as factors which affect the labor time required for preparing and serving school lunches. Data concerning the size of the kitchen and dining room and the length of the basic food route are included in Table 9 with information regarding the number of food items served and prepared and the number and kind of power machines provided for each lunch program studied.

### Kitchen area

The total kitchen area includes the space used for preparing food, washing dishes and serving. In those schools where food was prepared in the home economics laboratory, only the space used by the school lunch personnel for preparing food, washing dishes and serving was included as kitchen area. The number of square feet of kitchen space per revenue lunch served in each of 25 schools was determined

Table 9. Number of Food Items Prepared in 26 Iowa School
Food Route, Size of Kitchen and Dining Room, Table

| School | Food Items Served | Food Prepared in School Kitchen | Length of Basic Food Route | | Kitchen Area | | |
|---|---|---|---|---|---|---|---|
| | | | A[a] | B[b] | Total | Per Revenue Lunch Served | Per Average Daily Revenue Lunch Served |
| | No. | No. | Ft. In. | Ft. In. | Sq. Ft. | Sq. Ft. | Sq. Ft. |
| 230 | 6 | 5 | 53- 0 | 21- 6 | 391.5 | 1.9 | 1.70 |
| | 7 | 5 | | | | 1.6 | |
| | 5 | 4 | | | | 1.8 | |
| 110 | 19 | 14 | 123- 3 | 56- 3 | 1675.0 | 2.38 | 2.38 |
| 111 | 11 | 9 | 95- 9 | 44- 0 | 608.0 | 2.96 | 2.81 |
| 112 | 8 | 6 | 71- 6 | 24- 6 | 972.0[c] | 7.65 | 7.59 |
| 113 | 20 | 16 | 121- 9 | 56- 6 | 1162.0 | 2.30 | 2.26 |
| 121 | 6 | 4 | 49- 9 | 38- 6 | 227.5 | 2.27 | 2.28 |
| 122 | 7 | 5 | 58- 0 | 34- 9 | 214.6 | .96 | .74 |
| 123 | 6 | 4 | 51- 3 | 37- 3 | 545.8 | 1.96 | 1.49 |
| 211 | 10 | 7 | 91- 6 | 51- 6 | 1128.0[c] | 16.58 | 8.57 |
| 212 | 32 | 16 | 86- 6 | 64- 6 | 741.0 | 1.56 | 2.11 |
| 213 | 5 | 4 | 54- 3 | 37- 3 | 324.0 | 2.38 | 2.37 |
| 221 | 6 | 4 | 88- 9 | 59- 0 | 337.5 | 2.93 | 3.14 |
| 222 | 6 | 5 | 24- 0 | 18- 0 | 96.0 | 1.17 | .62 |
| 223 | 8 | 5 | 35- 0 | 28- 6 | 264.0 | 1.76 | 2.60 |
| 231 | 6 | 4 | 28- 0 | 14- 9 | 240.0 | 2.24 | 1.85 |
| 232 | 6 | 5 | 51- 6 | 17- 3 | 358.4[c] | 3.85 | 3.51 |
| 233 | 8 | 6 | 29- 9 | 20- 9 | 186.9 | .89 | .90 |
| 234 | 8 | 7 | 39-10 | 27-10 | 419.2 | 1.58 | 1.54 |
| 235 | 7 | 6 | 30- 9 | 19- 0 | 236.2 | 1.16 | 1.18 |
| 236 | 6 | 5 | 62- 3 | 38- 6 | 732.0[c] | 4.98 | 4.75 |
| 237 | 7 | 5 | 67- 0 | 32- 3 | 360.7 | 2.98 | 2.25 |
| 238 | 7 | 5 | 55-10 | 49-10 | 406.0[c] | 1.84 | 1.76 |
| 239 | - | - | 33- 9 | 28-10 | 262.5[c] | - | 2.96 |
| 2310 | 8 | 6 | 68- 8 | 27- 8 | 360.0[c] | 2.62 | 3.01 |
| 2311 | 6 | 5 | 45- 6 | 20- 6 | 302.2 | 2.34 | 2.32 |
| 2312 | 6 | 5 | 50- 6 | 29- 0 | 502.4[c] | 2.42 | 1.97 |
| 2313 | 8 | 5 | 47- 6 | 28- 0 | 151.2[c] | .86 | .85 |

[a]Total basic food preparation route

[b]Food route within preparation area

[c]Home economics laboratory

[d]No dining room, students ate

1 26 Iowa Schools on the Day Observed and the Length of the Basic
ning Room, Table Area and Number and Kind of Power Machines

| rea | Dining Room Area | | | Dining Table Surface Area | | Power Machines[e] | | |
|---|---|---|---|---|---|---|---|---|
| Per Average Daily Revenue Lunch Served | Total | Per Seat | Seats in Dining Room | Total | Per Seat | Dishwasher | Mixer | Peeler |
| Sq. Ft. | Sq. Ft. | Sq. Ft. | No. | Sq. Ft. | Sq. Ft. | No. | No. | No. |
| 1.70 | 906.1 | 7.08 | 128 | 240.0 | 1.87 | 0 | 1 | 0 |
| 2.38 | 4350.0 | 12.72 | 342 | 684.0 | 2.00 | 1 | 1 | 0 |
| 2.81 | 2340.0 | 9.59 | 244 | 610.0 | 2.50 | 1 | 0 | 0 |
| 7.59 | 562.5 | 8.27 | 68 | 148.7 | 2.19 | 0 | 0 | 0 |
| 2.26 | 3850.0 | 11.06 | 348 | 732.0 | 2.10 | 1 | 1 | 0 |
| 2.28 | 1600.3 | 8.42 | 112 | 238.0 | 1.25 | 0 | 1 | 0 |
| .74 | 1116.0 | 10.33 | 268 | 252.5 | 2.34 | 0 | 0 | 0 |
| 1.49 | 1242.5 | 9.14 | 130 | 204.0 | 1.50 | 1 | 1 | 0 |
| 8.57 | 0.0[d] | 0.00 | 0 | 0.0 | 0.00 | 1 | 1 | 1 |
| 2.11 | 2337.0 | 8.72 | 108 | 660.0 | 2.46 | 1 | 1 | 1 |
| 2.37 | 972.0 | 7.48 | 136 | 260.0 | 2.00 | 0 | 1 | 0 |
| 3.14 | 1936.0 | 15.36 | 126 | 250.0 | 1.98 | 0 | 1 | 0 |
| .62 | 624.0 | 7.80 | 80 | 132.0 | 1.65 | 0 | 0 | 0 |
| 2.60 | 825.0 | 8.59 | 96 | 187.4 | 1.95 | 0 | 0 | 0 |
| 1.85 | 480.0 | 8.00 | 60 | 120.0 | 2.00 | 0 | 0 | 0 |
| 3.51 | 409.0 | 7.05 | 58 | 88.0 | 1.52 | 0 | 0 | 0 |
| .90 | 420.0 | 7.00 | 60 | 120.0 | 2.00 | 0 | 0 | 0 |
| 1.54 | 408.5 | 5.11 | 80 | 117.5 | 1.47 | 0 | 0 | 0 |
| 1.18 | 946.0 | 9.75 | 97 | 119.0 | 1.23 | 0 | 0 | 0 |
| 4.75 | 636.0 | 12.72 | 50 | 120.0 | 2.40 | 0 | 0 | 0 |
| 2.25 | 555.0 | 6.94 | 80 | 128.0 | 1.60 | 0 | 0 | 0 |
| 1.76 | 575.0 | 10.27 | 56 | 142.5 | 2.54 | 1 | 0 | 0 |
| 2.96 | 297.5 | 4.96 | 60 | 80.2 | 1.34 | 0 | 0 | 0 |
| 3.01 | 676.5 | 10.57 | 64 | 142.5 | 2.23 | 0 | 0 | 0 |
| 2.32 | 384.4 | 7.39 | 52 | 85.0 | 1.63 | 1 | 0 | 0 |
| 1.97 | 514.7 | 6.86 | 75 | 155.5 | 2.07 | 0 | 0 | 0 |
| .85 | 548.2 | 6.94 | 79 | 161.0 | 2.04 | 0 | 0 | 0 |

s laboratory

[e]No schools had grinders or slicers

n, students ate in classrooms and library

both on the basis of the number served on the day observed and the average daily number served during the school year. (See Table 9.) The figure determined on the latter basis was considered to be more representative of the capacity for which the space and facilities of the lunchroom were planned.

The number of square feet of kitchen space per the average daily number of revenue lunches served in 25 schools ranged from .62 to 8.57 and averaged 2.31 square feet. Dreisbach and Handy (25) found that in 39 schools the number of square feet per lunch served on the day observed ranged from .56 to 4.08. Bryan (18) suggested that 1.5 to 2 square feet per person served proved to be a satisfactory kitchen space allowance in most schools. Habig (37) reported that in 165 Indiana schools the number of square feet of kitchen space per person served ranged from .5 to 14.1 and the median was 2.5 square feet.

Analysis of covariance showed that when the kitchen area provided in 25 Iowa schools was adjusted to a common mean number of average daily revenue lunches served, differences between the three groups of schools were highly significant.

In all of the high schools the per lunch kitchen space provided exceeded the 2 square feet suggested by Bryan (18). The average for the six schools in this group was 3.34

square feet and the range was from 2.11 to 8.75. In the two schools where there were 7.59 and 8.75 square feet of kitchen space provided per lunch served, the home economics laboratory was used as the school lunch kitchen. In Schools 111, 113 and 212, the only ones where the serving areas were units separate from the kitchen, the total kitchen areas per lunch served were not the largest.

The average number of square feet of kitchen space per lunch served in the elementary schools was 1.50 and the range was from .62 to 3.14. In the two schools where the space was less than 1 square foot per lunch served, the space for the kitchen and dining room had been used previously as a class room. The kitchen in School 122 was located at one end of the room. In School 222 the kitchen equipment was limited and only one corner of the room was utilized as a preparation and service area.

The number of square feet of kitchen space per lunch served ranged from .85 to 4.75 in the schools with 12 grades and the average for the 13 schools was 2.03 square feet. More than the suggested minimum of space was provided in 11 schools; in two there was less than one square foot of kitchen space per lunch served. The kitchen where .9 square foot was provided was a small area across one end of a room which had been a classroom. The kitchen where .85 square foot of space was provided had been a storeroom and was

equipped for school lunch preparation as well as for a home economics laboratory.

In seven of the schools with 12 grades, the home economics laboratory was utilized as kitchen space for the lunch program. The amount of kitchen space per lunch served depended upon the size of the laboratory and the extent of the area regularly used by the school lunch personnel. It exceeded 3 square feet in three schools.

Dining room space

The dining room area included the space provided for the tables and chairs or benches used for dining room service for the school lunchroom. If a gymnasium was arranged at noon as a dining room, that space was considered as dining room area. If the students ate in classrooms or other space not arranged specifically for school lunch service, the space was not considered.

The dining room area in each of 25 schools was compared on the basis of the number of square feet of space provided for each seat in the dining room. In two high schools, Schools 111 and 213, and two elementary schools, 121 and 221, there was enough space for all students to eat at one time. In the other schools classes were scheduled so that students ate in shifts and service continued for one hour and in a few instances one and one half hours. In School 212 there

were four serving periods.

Analysis of covariance indicated that when the amount of dining room space provided in 25 Iowa schools was adjusted to a common mean number of seats in the dining room, differences between the three groups of schools were not significant. There was wide variation among schools within each group in the amount of dining room space provided. (See Appendix E, Table 24.)

The number of square feet of dining room space per seat in 24 Iowa schools ranged from 0 to 15.36; the range was from 0 to 11.06, 7.8 to 15.36 and 4.96 to 12.72 square feet in the high, elementary and schools with 12 grades respectively. (See Table 9.)

Nine square feet of space for each person seated at one time have been suggested as minimum for school lunchroom service (130) (123). On the basis of this standard the dining room areas in four high schools, three elementary schools and nine schools with 12 grades were inadequate. In Schools 112 and 213 the balconies of the gymnasiums had been converted into permanent dining rooms; in School 235 the balcony was arranged each day for dining room service. The gymnasium was set up each day as a dining room in Schools 121 and 221. In Schools 232 and 2312 corridors had been made into permanent dining rooms. In two elementary schools and nine schools with 12 grades where the area was

inadequate, benches were used. In general more students can be served at one time when benches instead of chairs are used. In School 211 there was no dining area provided; the students ate in classrooms, dressing rooms or the study hall.

Dining table surface area

The area of the dining room table surface was measured to compare the amount of table space provided in each school per number of seats in the dining room. Analysis of covariance showed that when the amount of table space provided in 25 Iowa schools was adjusted to a common mean number of seats in the dining room, differences between the three groups of schools were highly significant. (See Appendix E, Table 25.)

The average amount of space provided by 24 schools was 2.03 square feet. In the high schools the range was from 0 to 2.50 square feet, in the elementary schools 1.25 to 2.34 and in the schools with 12 grades 1.23 to 2.40. The average amount of space provided was 2.67, 1.56 and 1.81 square feet per seat respectively.

No records were found of similar figures reported by other investigators. The writer acknowledges the fact that the number of linear feet provided per seat in the dining room would give a more accurate estimate of the amount of

space provided for each student at a table.

Length of basic food route

The length of the principal route traveled by the school lunch personnel to prepare food was determined by using the method suggested by the United States Bureau of Human Nutrition and Home Economics (112). The total basic food preparation route included the distance from the storeroom to the sink supplying water for preliminary cleaning, to the cook's work table, to the range, to the serving counter. This route was drawn and measured on the kitchen layout. Since there were extreme variations between schools in the distance from the storeroom to the preparation sink, this distance was excluded to determine the length of the route within the food preparation area.

In 25 schools the length of the total basic food preparation route varied from 24 to 121.75 feet and averaged 57.55. (See Table 9.) The Bureau of Home Economics and Human Nutrition (112) reported that in 18 schools, each serving from 300 to 500 meals, the length of the total basic food route ranged from 35 to 116 feet and averaged 66. Dreisbach and Handy (25) found that in schools serving 75 to 350 lunches, the length of the route ranged from 26 to 107 feet and averaged 58 and in schools serving 350 to 500 lunches, the length varied from 35 to 80 feet and averaged 56.

The average lengths of the total basic food routes in the high schools, elementary schools and the schools with 12 grades were 86.87, 51.12 and 46.99 feet respectively. Excluding the distance from the storage area to the preparation sink, the average lengths of the routes were reduced to 46.37, 36.00 and 27.25 feet. In the larger high schools the storage area was often located in the basement or in another storage area of the building some distance from the kitchen. In the smaller schools of all three groups the storage area was more often connected with the kitchen or was a part of the kitchen area.

When the distance from the storeroom to the preparation sink was excluded as a factor influencing the length of the basic food route, the length of the routes still varied considerably and ranged from 14.75 to 59 feet.

The fact that in some large kitchens the basic food route was shorter and in some smaller kitchens the route was longer was attributed to the arrangement of the equipment and the location of the serving area in relation to the preparation area. The serving unit in the school having the longest basic route was 28 feet from the kitchen entrance. In addition, because of the arrangement of the equipment in the preparation area, there was considerable cross and reverse traffic which further increased the length of the route.

In eight schools the basic food routes were direct with little across or reverse traffic. The length of the basic food route and the area of these kitchens are compared:

| School | Length of Basic Food Route | Total Kitchen Area | Per Meal Kitchen Area |
|---|---|---|---|
| 113 | 56.50 feet | 1162 sq. ft. | 7.59 sq. ft. |
| 211 | 51.50 | 1128 | 8.57 |
| 111 | 44.00 | 608 | 2.81 |
| 237 | 32.25 | 360 | 2.25 |
| 239 | 28.83 | 262 | 2.96 |
| 2311 | 20.50 | 302 | 2.32 |
| 232 | 17.25 | 358 | 3.51 |
| 231 | 14.75 | 240 | 1.85 |

Although the total basic food route in some of these schools was longer than the average, the equipment in the preparation area had been arranged to minimize the distance necessary for the workers to travel in preparing and serving the food. School 231 had the shortest basic food route of the 25 schools. The kitchen was built across one end of the dining room area and the surface used for the cook's preparation table was used for the serving counter. Distances between the preparation units were short and there was little cross or reverse traffic.

Figure 1 shows a school lunch kitchen with a relatively large food preparation and serving area and a relatively short food route. The basic food route within the preparation area is direct and with no cross or reverse traffic. There was one point of cross traffic in the service area

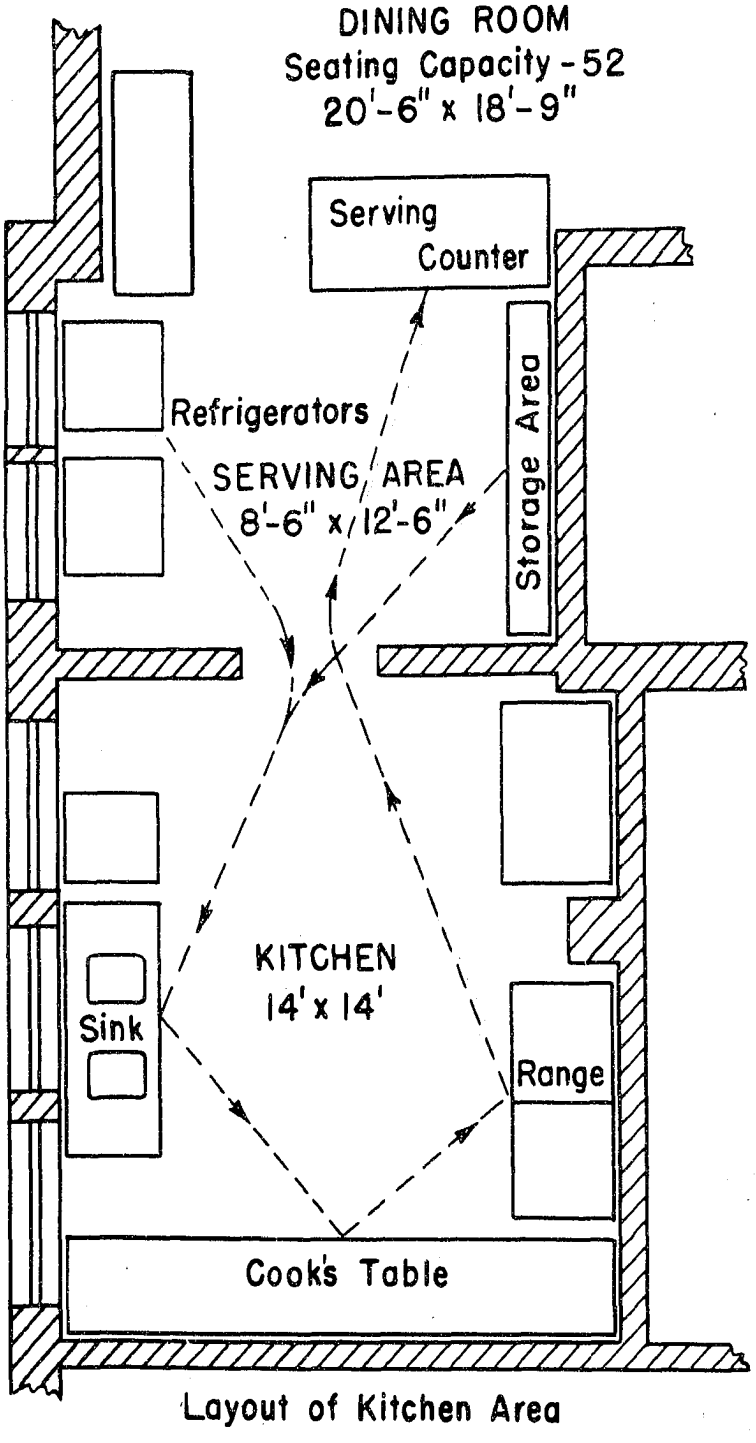


Fig.1 A Direct Basic Food Preparation Route

because of the location of the refrigerators. While the per meal preparation and serving area was larger than the average for the schools with 12 grades the basic food preparation route was less. The workers in this lunch program had considered placing a narrow table in the center of the kitchen area to minimize the distance from the sink to the cook's table to the range. This arrangement would not change the direction of the route but would decrease the distances from the sink to the cook's table and from the table to the range.

Training and experience of personnel and organization of work

The training and experience of the personnel and the organization of the work for each lunch program are described in detail in Appendix C.

In the three high schools in cities of 50,000 population and over, the school lunch was under the supervision of the person responsible for the management of the lunch program in the city school system. Home economics teachers supervised the lunch programs in the other three high schools. At least one cook or cook-manager in each of three of the schools in this group had worked previously in restaurants or college residence halls or for several years in school lunch kitchens. The cooks in one school had not had previous quantity food service experience but had attended a

course for food handlers. None of the personnel in the other two schools of this group had been employed previously in any quantity food service units. Students worked part-time in all but one of the schools in this group.

Lunch programs in the three elementary schools in cities having more than 50,000 population and in one in a smaller town were supervised by the person responsible for the lunch programs in the city school system. Two of these supervisors had worked in commercial food service before being employed in school lunch work and two were home economists. In one of the remaining two elementary schools one employee had been a school lunch cook for 26 years, in the other the cook-manager had not had previous experience in quantity food preparation and service. In two of the schools in this group student workers were employed.

Cook-managers were responsible for the management of the lunch programs in nine of the schools having 12 grades. Employees in three of these schools had worked for five years or more in school lunch kitchens or restaurants. In two of the other six schools the home economics teacher was responsible for the lunch program; in another a mother's club supervised the program. In two schools the cook-managers organized the work and purchased the food but the home economics teacher in one and the school superintendent's wife in the other planned the menus. Student workers

assisted the employees in six schools.

In general the lunch programs in the schools in larger cities were supervised by the person responsible for the manager of the lunch program in the city school system. A majority of the workers in these schools were women who had worked for five years or more in commercial, hospital or school lunch kitchens. Work was organized and scheduled daily and in most schools employees were expected to work a specific number of hours each day. Time for special cleaning duties and preparation for the following day was scheduled usually for the afternoon hours.

In the schools in cities and towns with less than 50,000 population and in the schools with 12 grades, a majority of the employees were homemakers over 50 years of age with no previous quantity food service experience. Work schedules were planned in only a few of these schools; the workers were permitted to leave as soon as the routine duties for the day were completed. In general the employees in these schools seemed to have more difficulty arranging work so that food was prepared on time and they appeared to be working more strenuously than the cooks in the larger schools where specific work schedules were planned daily. This could be attributed partially to the lack of adequate equipment in the smaller schools, the lack of experience of the workers or the fact that work had to be completed

early in the afternoon in schools where the home economics laboratory was used as the school lunch kitchen.

## Per Meal Labor Time in Relation to Space, Layout and the Organization of Work

The average per meal labor time on the day observed, the average per meal kitchen area, the average per seat dining room area and the average length of the basic food route in each group of schools are compared in Table 10.

Table 10. Average Per Meal Labor Time for Three Groups of Schools in Relation to the Amount of Lunchroom Area Provided and the Length of the Basic Food Route

| Schools | Per Meal | | Per Seat Dining Room Area Sq. Ft. | Length of Basic Food Route Ft. |
|---|---|---|---|---|
| | Labor Time Min. | Kitchen Area Sq. Ft. | | |
| High schools | 8.4 | 3.34 | 11.13 | 86.87 |
| Elementary schools | 7.0 | 1.50 | 9.04 | 51.12 |
| Schools with 12 grades | 7.2 | 2.03 | 7.86 | 46.99 |
| Total schools | 7.5 | 2.31 | 9.38 | 57.55 |

On the basis of these averages there seemed to be some relationship between the amount of labor time expended per meal on the day observed and the kitchen and dining room area provided and the length of the basic food route. The higher average per meal labor time expended in the high schools

might be attributed partially to the fact that the average space allowances and the distances traveled in food preparation and service were greater for this group of schools. Another reason was that for School 211 the per meal labor time was extremely high on the day observed because less than the usual number of students ate lunch at school.

The average amount of dining room space and the length of the basic food route were greater for the elementary schools than for the schools with 12 grades while the average amount of kitchen space and labor time were less. Since the majority of the work is done in the kitchen, the fact that in the elementary schools the average kitchen space was smaller might have accounted in part for the average labor time being slightly lower than in the schools with 12 grades.

The schools with the highest and lowest number of minutes of labor time expended per meal in each of the three groups of schools are compared in relation to kitchen and dining room space and the length of the basic food route. The data for School 211 were excluded since they were not representative of the usual number of students served.

| Schools | Per Meal Labor Time | Per Meal Kitchen Space | Per Seat Dining Room Space | Length Basic Food Route |
|---|---|---|---|---|
| 111 | 12.1 min. | 2.81 sq. ft. | 9.59 sq. ft. | 95.75 ft. |
| 113 | 5.7 | 2.26 | 11.06 | 121.75 |
| 121 | 13.4 | 2.28 | 8.42 | 49.75 |
| 122 | 5.4 | .74 | 10.33 | 58.00 |
| 237 | 11.3 | 2.25 | 6.94 | 67.00 |
| 233 | 5.4 | .90 | 7.00 | 29.75 |

There appeared to be some relationship between labor time expended and the kitchen space per meal served.

Three types of school lunch supervision are represented in these schools where there were extremes in per meal labor time. Schools 111 and 122 were located in the same city and the lunch programs were supervised by the person responsible for all of the lunch programs in the city school system. Likewise, the lunchrooms in Schools 113 and 121, which were located in the same city, were supervised by the person responsible for the lunch programs in the school system. In these four schools daily work schedules were planned and the employees worked a specific number of hours.

In School 233 the head cook was responsible for the supervision of the lunch program; the work was organized daily according to the menu and all employees were permitted to leave as soon as the routine work for the day was completed. A school lunch mother's club supervised the lunch program in School 237. According to the employees, they

usually worked longer than the eight hours scheduled in order to complete the work for the day.

The extent to which space allowances, layout and organization of work affect the labor time is difficult to determine since it is recognized that the number of lunches served, the training and experience of the personnel, the work habits of the individual workers, the amount and kind of equipment available, the number and type of food items prepared and served, and the number of cleaning duties required of the personnel are other factors which can influence the amount of labor time expended per meal served.

## Equipment

The amount and type of equipment provided have been referred to as factors affecting the divisions of labor time and the per meal labor time expended in preparing and serving school lunches. There were differences, as shown in Table 11, between the three groups of Iowa schools in the amount of institution equipment provided for the lunchroom kitchen. Most of the high schools and the elementary schools in the cities with a population of 50,000 or over had more institution type equipment than the elementary schools in the smaller towns and the schools with 12 grades regardless of the number served.

Table 11. Amount and Type of Institution Equipment in 25 Iowa Schools

| Schools | Average Daily Revenue Lunches | Range | Deck Ovens | Steamer | Steam Jacketed Kettle | D.W. Machine | Three-Comp. Sink | Electric Mixer | Vegetable Peeler |
|---|---|---|---|---|---|---|---|---|---|
| | No. | No. Units | No. Decks | No. Comp. | Qt. Cap. | No. Tanks | No. | Qt. Cap. | Lb. Cap. |
| **High schools** | | | | | | | | | |
| 111 | 216 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 112[a] | 128 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113 | 513 | 1 | 0 | 3 | 20 | 1 | 0 | 20 | 0 |
| 211[a] | 132 | 1 | 0 | 0 | 0 | 1 | 0 | 20 | 15 |
| 212 | 351 | 1 | 2 | 2 | 30 | 1 | 0 | 30 | 15 |
| 213 | 137 | 2 | 0 | 0 | 0 | 0 | 0 | 10 | 0 |
| **Elementary schools** | | | | | | | | | |
| 121 | 100 | 0 | 4 | 0 | 20 | 0 | 0 | 20 | 0 |
| 122 | 291 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 123 | 366 | 1 | 3 | 3 | 0 | 1 | 0 | 20 | 0 |
| 221 | 108 | 2 | 0 | 0 | 0 | 0 | 0 | 20 | 0 |
| 222 | 154 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 223 | 101 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Schools with 12 grades** | | | | | | | | | |
| 231 | 130 | 1 | 4 | 0 | 0 | 0 | 1 | 0 | 0 |
| 232[a] | 102 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233 | 208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 234 | 271 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 235 | 200 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 236[a] | 154 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 237 | 160 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 238[a] | 231 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 239[a] | 89 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2310[a] | 120 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2311 | 130 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 2312[a] | 254 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2313[a] | 177 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

[a]Home Economics Laboratory.

The number of lunches served seemed to make little difference in the type and amount of equipment available in the schools with 12 grades. Dreisbach and Handy (25) found that schools serving larger numbers of lunches had more power equipment than the schools serving smaller numbers. Habig (37) reported that in 165 Indiana schools the number served seemed to make little difference in the amount of equipment provided.

The per cent of 25 Iowa schools having certain types of equipment is compared with similar data reported by Dreisbach and Handy (25) and Habig (37):

| Equipment | Donaldson | Dreisbach and Handy (25) | Habig (37) |
|---|---|---|---|
| Range | 68% | 84% | 67% |
| Deck oven | 16 | 26 | 26 |
| Dishwashing machine | 24 | 43 | 13 |
| Three-compartment sink | 12 | 26 | 38 |
| Electric mixer | 28 | 46 | 70 |
| Vegetable peeler | 12 | 36 | 13 |
| Grinder and slicer | 0 | 23 | 52 |

In general the schools were provided with less labor saving equipment than the other schools investigated. In most of the schools having 12 grades, surplus school lunch funds were used to purchase kitchen equipment. For the schools serving less than 200, it was difficult to operate the program to provide enough surplus to purchase institution type equipment.

Sixty per cent of the schools were provided with large

reach-in refrigerators; the others had the small family size type. Dreisbach and Handy (25) found that all of the 39 schools investigated had some type of refrigeration. Habig (37) reported that only 19 per cent of the Indiana schools had adequate refrigeration.

Family size ranges were used in eight of the 25 Iowa school lunch kitchens; in five of these the home economics laboratory equipment was used. In School 239 there was a small electric mixer and in School 2311 a family size electric dishwasher.

Only 40 per cent of schools were provided with good dishwashing facilities. These included three schools having three-compartment sinks for washing, rinsing and sterilizing dishes, one having a family size dishwashing machine and six with institution type dishwashing machines.

According to the standards published by the United States Production and Marketing Administration (123), none of the schools having 12 grades were provided with adequate kitchen equipment. There was an apparent lack of small equipment in this group of schools which made it difficult to standardize the number and size of portions of food prepared and served.

The lack of equipment, especially ovens, limited the types of menu items prepared in many of the school lunch kitchens. The low per meal labor time in some schools,

which were not provided with adequate equipment, might be partially attributed to the fact that ready-to-eat foods and foods requiring less preparation time and less equipment were included on the menu.

In those schools where the employees seemed to work more strenuously and had difficulty in preparing the food in time for service, there was usually little labor saving equipment provided in the school lunch kitchen.

## Income and Expenditures

Control of expenses, particularly of food and labor, is an important aspect of the management of school lunch programs which operate on a limited income and provide attractive, palatable and nutritionally adequate meals. To determine the amount of various sources of income and compare the types of expenses which were paid from school lunch funds, the source and expenditure distribution of the income in 22 Iowa schools for the year 1948-49 were analyzed. (See Table 12.)

### Source distribution of income

The percentage source distribution of income for the three groups of schools and the total number of schools showed slight differences in the income received from the sale of lunches and greater differences in the income from

Table 12. Percentage Source and Expenditure Distribution of School Lu

| School | Source Distribution of Income | | | | | | Food for Lunches | M O |
|---|---|---|---|---|---|---|---|---|
| | Lunches % | Milk Only % | Banquets % | Candy Ice Cream % | Reimbursement % | Other % | % | |
| 230 | 79.40 | 0 | 0 | 0 | 20.60 | 0 | 62.96 | |
| 110 | 80.00 | 1.80 | 12.34 | 5.22 | 0 | 0 | 50.00 | |
| 111 | 77.06 | 7.85 | 0 | 0 | 13.09 | 2.00 | 50.27 | |
| 112[b] | - | - | - | - | - | - | - | |
| 113 | 83.10 | .79 | 6.29 | 9.82 | 0 | 0 | 49.04 | |
| 121 | 66.88 | .00 | 13.81 | 3.12 | 15.23 | .96 | 45.77 | |
| 122 | 73.41 | 3.42 | 0 | 0 | 23.17 | 0 | 48.91 | |
| 123 | 73.46 | 2.29 | 5.46 | 0 | 18.79 | 0 | 48.90 | |
| 211 | 56.46 | 12.98 | 0 | 12.15 | 18.41 | 0 | 34.36 | 1 |
| 212 | 84.18 | 1.48 | 1.94 | 0 | 0 | 12.40 | 62.72 | |
| 213[b] | - | - | - | - | - | - | - | |
| 221 | 79.82 | 2.15 | 0 | 0 | 18.03 | 0 | 50.76 | |
| 222 | 60.14 | 9.85 | 0 | 0 | 30.01 | 0 | 45.79 | 2 |
| 223 | 83.42 | .03 | 0 | 0 | 16.55 | 0 | 54.49 | |
| 231 | 82.26 | 0 | 0 | 0 | 17.74 | 0 | 57.71 | |
| 232 | 79.72 | 0 | 0 | 0 | 20.28 | 0 | 44.74 | |
| 233 | 78.17 | 3.06 | 0 | 0 | 18.49 | .28 | 62.62 | |
| 234 | 78.87 | 0 | 0 | 0 | 21.13 | 0 | 66.19 | |
| 235 | 77.18 | 0 | 0 | 0 | 22.82 | 0 | 57.58 | |
| 236 | 75.78 | 0 | 0 | 0 | 24.22 | 0 | 57.12 | |
| 237 | 83.69 | 0 | 0 | 0 | 16.31 | 0 | 60.82 | |
| 238 | 78.03 | 0 | 0 | 0 | 21.97 | 0 | 57.30 | |
| 239 | 79.59 | 0 | 0 | 0 | 20.41 | 0 | 57.09 | |
| 2310 | 77.73 | 0 | 0 | 0 | 22.73 | 0 | 56.02 | |
| 2311[b] | - | - | - | - | - | - | - | |
| 2312 | 73.73 | 1.31 | 0 | 0 | 23.46 | 1.50 | 72.51 | |
| 2313 | 78.87 | 0 | 0 | 0 | 21.13 | 0 | 61.00 | |

[a]Included with cost of food for banquets

[b]Financial reports for the year were not available

[c]Items not classified in financial reports

School Lunch Income of 24 Iowa Schools for the School Year 1948-49

| | Expenditure Distribution of Income | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| d for ches | Milk Only % | Banquets % | Candy Ice Cream % | Labor % | Repair and Replacement % | Other[c] % | Surplus % | Loss % |
| .96 | 0 | 0 | 0 | 29.94 | 0 | 4.21 | 2.80 | 0 |
| .00 | 1.43 | 12.87 | 0[a] | 27.49 | 4.00 | 2.76 | 1.45 | 0 |
| .27 | 6.22 | 0 | 0 | 41.01 | 3.46 | 1.93 | 0 | 2.89 |
| - | - | - | - | - | - | - | - | - |
| .04 | .63 | 6.56 | 0[a] | 34.96 | 6.67 | 0 | 2.14 | 0 |
| .77 | 0 | 9.65 | 0[a] | 34.61 | 4.00 | 1.49 | 4.48 | 0 |
| .91 | 3.24 | 0 | 0 | 36.34 | 0 | 2.60 | 8.91 | 0 |
| .90 | 2.17 | 6.67 | 0 | 27.72 | 4.00 | 3.22 | 7.32 | 0 |
| .36 | 11.74 | 0 | 17.17 | 27.54 | 2.85 | 0 | 6.34 | 0 |
| .72 | 1.17 | 4.92 | 0 | 19.08 | 4.50 | 2.27 | 5.34 | 0 |
| - | - | - | - | - | - | - | - | - |
| .76 | 1.93 | 0 | 0 | 35.95 | 0 | 8.31 | 3.05 | 0 |
| .79 | 23.15 | 0 | 0 | 24.06 | .27 | 6.77 | 0 | .04 |
| .49 | .03 | 0 | 0 | 30.32 | .96 | .61 | 13.59 | 0 |
| .71 | 0 | 0 | 0 | 29.10 | 5.95 | 5.49 | 1.75 | 0 |
| .74 | 0 | 0 | 0 | 45.08 | 0 | 6.70 | 3.48 | 0 |
| .62 | 3.37 | 0 | 0 | 21.26 | 6.41 | 0 | 6.34 | 0 |
| .19 | 0 | 0 | 0 | 31.00 | .33 | 0 | 2.48 | 0 |
| .58 | 0 | 0 | 0 | 37.34 | 0 | 2.79 | 2.29 | 0 |
| .12 | 0 | 0 | 0 | 48.90 | 0 | 2.08 | 0 | 8.19 |
| .82 | 0 | 0 | 0 | 27.23 | 0 | 13.33 | 0 | 1.38 |
| .30 | 0 | 0 | 0 | 27.02 | 0 | 15.14 | .54 | 0 |
| .09 | 0 | 0 | 0 | 40.67 | 7.32 | 1.37 | 0 | 6.45 |
| .02 | 0 | 0 | 0 | 39.75 | .29 | 2.26 | 1.68 | 0 |
| - | - | - | - | - | - | - | - | - |
| .51 | 1.31 | 0 | 0 | 25.96 | .93 | .80 | 0 | 1.51 |
| .00 | 0 | 0 | 0 | 29.78 | 4.60 | 3.40 | 1.22 | 0 |

other sources:

| Sources of Income | High Schools | Elementary Schools | Schools With 12 Grades | Total Schools |
|---|---|---|---|---|
| Lunches | 78.68% | 73.29% | 78.50% | 77.28% |
| Reimbursement | 5.41 | 19.97 | 20.79 | 15.52 |
| Milk | 4.26 | 2.62 | .51 | 2.27 |
| Banquets | 2.36 | 3.58 | .00 | 1.66 |
| Candy and Ice Cream | 4.10 | .41 | .00 | 1.45 |
| Other | 5.19 | .13 | .20 | 1.82 |

Habig (37) found that in 165 Indiana schools where Type A lunches were served, the median percentage of income received for lunches was 78.

The income from the sale of lunches was approximately 5 per cent lower for the elementary schools than for the other groups of schools and for the total schools. In one of the elementary schools 13.8 per cent of the income was from food served at banquets; in another 44 per cent of the lunches served during the year were free and milk was provided free for many of the pupils who brought their lunch.

The percentage of income received from federal funds was similar in the elementary schools and the schools with 12 grades but was considerably lower for the high schools. Only two of four high schools studied were participating in the National School Lunch Program and the amount of reimbursement provided for those schools was 14 per cent of the total cash income. Some students in these two schools did not accept milk with their lunch; the lunch program,

therefore, did not receive maximum reimbursement for those Type A lunches served without milk.

Reimbursement from federal funds in 165 Indiana schools amounted to 19 per cent of the school lunch income (37). James (46) found that 25 per cent of the school lunch income in a rural Iowa school with 12 grades was from federal funds. The students accepted milk with their lunches and the school received maximum reimbursement. The only other source of income was from the sale of lunches.

Statistics published by the United States Production and Marketing Administration (125) indicated that in 1948-49, an average of 6 cents of a per lunch income of 25 cents or 24 per cent of the per lunch income for all schools participating in the National School Lunch Program was provided from federal funds.

The percentage of income from reimbursement in six Iowa elementary schools and 12 schools with 12 grades was similar to that for the Indiana schools; it was lower, however, than other percentages reported (46) (125). This variation could have been due partially to the fact that some schools did not qualify for maximum reimbursement and some of the elementary schools had additional sources of income.

Income from milk varied in the three groups of schools. In 11 of 22 schools milk was sold in addition to the milk served with the plate lunch; these included four high schools,

five elementary schools and two schools with 12 grades.

In two high schools and two elementary schools the personnel were responsible for serving meals for other school functions. In two high schools and one elementary school candy and ice cream were sold in addition to the lunch. In Schools 123 and 212 the percentage spent for food for the banquets exceeded the income from the banquets and in School 211 the cost of the candy and ice cream exceeded the income received from their sale. These excesses of expenses over income might have been due to errors in the financial records. In some schools food for banquets is provided at a limited cost for school organizations and for special functions for promoting public relations and the welfare of the program and the income is not expected to cover expenses. That the school lunch program should subsidize social functions is questionable. It was interesting to note that none of the schools with 12 grades provided food for other occasions or sold candy and ice cream.

The percentage of income received from other sources not classified varied among the schools in each group and between the three groups. In one high school food was sometimes sold for use in the home economics laboratory and for refreshments for student meetings and social functions. In some schools other income was from donations or the sale of left-over food. For most of the schools the

source of the other income was not included in the financial report.

Expenditure distribution of income

The percentage distribution of expenses is based on the total cash income received in each of 22 lunch programs for the school year of 1948-49. (See Table 12.)

The cost of food for the lunches was reported separately from the cost of milk, food for banquets, candy and ice cream. The cost of the food for employees' meals was not included in the food cost but was included as a part of the labor costs. Labor costs also included the wages paid and the school's share of Iowa Old Age and Survivors Insurance if paid from school lunch funds. Cost of repairs and replacement of equipment was classified as a separate expense for those schools which reported them as such. This cost was not reported for some schools and presumably was listed as other expense. Other expenses included those not classified in the financial report.

In Table 13 the average percentage expenditure distribution of the income for the three groups of Iowa schools and for 22 schools are compared with the distribution of expenditures reported by other investigators. In this table the costs of milk sold, food for banquets, candy and ice cream were included in other costs in order to compare the

cost of the food used for lunches with the findings of other studies.

The average percentage expenditure for 22 Iowa schools was lower for food than that reported in other studies and higher for labor. These differences might be attributed in part to the difference in the methods used for determining the costs. Including insurance and employees' meals as labor

Table 13. Percentage Expenditure Distribution of School Lunch Income

| Study | Food % | Labor % | Other % |
|---|---|---|---|
| Donaldson | | | |
| High schools | 54.13 | 30.19 | 15.68 |
| Elementary schools | 52.68 | 33.95 | 13.37 |
| Schools with 12 grades | 61.15 | 31.76 | 7.09 |
| Total schools | 56.84 | 31.75 | 11.41 |
| Waye (129 | 68.00 | 26.23 | - |
| Habig (37) | 69.00 | 26.00 | - |
| James (46) | 58.53 | 29.00 | 12.47 |
| Brughelli (17) | 50.00-51.00 | 18.23 | - |
| Todhunter and Tucker (109) | 50.00-90.00 | 17.00-35.00 | 0.00-10.00 |
| Moulton (73) | 72.50 | 13.20 | 14.30 |
| West and Wood (130) | 60.00-70.00 | 25.00-29.00 | - |
| Bryan (18) | 65.00 | 27.50 | 7.50 |

costs and deducting the value of employees' meals from food cost might have accounted to some extent for the difference in percentages for food and labor. James (46) used the same method for calculating the percentage distribution of expenses for an Iowa school with 12 grades. These figures

coincided more closely with the findings of the present study than the other percentages reported. Moulton's (73) figures for an Iowa high school showed the lowest percentage expenditure for labor and did not correspond to the findings for the high schools in the present research. In the high school studied by Moulton (73), the school lunch kitchen was used as a quantity food preparation laboratory for college students; the students received class credit for the experience and lunch as remuneration on the day they helped prepare and serve food.

The range for the percentage of income used for food was from 34.36 to 72.51. The percentage was higher for the schools with 12 grades than for the other two groups of schools; in this group there were fewer other items of expense.

The percentage of income expended for labor in the individual schools varied from 19.08 to 48.90 and the average was highest for the elementary schools and lowest for the high schools. There was less variation between schools in the percentage of expenditures for food and for labor in the elementary schools than in the other groups of schools. In School 212, where the percentage of income expended for labor was the lowest for all schools, there were three full-time employees and 28 student workers. The students received lunch as remuneration for one hour of work which was

a lower rate of pay than for full-time employees. In general the high schools used more student employees than the other schools; this accounted in part for the lower percentage of labor expense. In School 236, where the greatest percentage of income was used for labor, the deficit for the year was the highest for all schools. In School 232 the percentage of income spent for labor exceeded that spent for food.

Bryan (18) reported that in 1935 the ratio of food cost to labor cost in some school lunch programs was 2.3 to one, the lowest was 1.58 and the highest 2.5. Waye (129) found that in 62 Ohio schools in 1951 the average ratio was 2.7 to one, and varied from 0.8 to 5.3. For 22 Iowa schools the average ratio during 1948-49 was 1.8 to 1 and the range was from .99 to 3.55.

Factors which seemed to influence the percentage expenditures for food and labor were food prices, wage levels, monetary value of donated commodities used and other expenses paid. The value of the commodities used in the schools on the day observed was obtained, but the value of those used during the school year of 1948-49 was not available.

Food prices varied according to the location of the school and the method of purchasing. In the schools in larger towns and cities food was purchased at wholesale prices. In a majority of other schools food was purchased

either from wholesale dealers or from local grocers who reduced the retail cost 10 per cent. (See Appendix C.)

Wages varied from 60 to 140 dollars per month. Employees in the high schools and elementary schools in cities of 50,000 population and over and employees with experience in quantity food service received the highest wages. Wages for part-time workers varied from 58 to 85 cents per hour.

In fifteen schools the expenses for repairs and replacement of equipment were paid from school lunch income. Some schools reported all expenses other than food and labor as other expenses without classifying the items. In the high schools and elementary schools in cities over 50,000 population expenses for utilities, laundry, cleaning supplies, garbage removal and pro-rated operating costs were paid from school lunch income. The pro-rated amount charged per month in some schools paid for the services of the city school lunch supervisor and for some supplies and equipment. In one school the home economics teacher was paid a small amount from school lunch funds for managing the lunch program. In all of the schools space and janitor service were provided without charge by the board of education.

In the 22 Iowa schools, in general, the school lunch programs were expected to be self-supporting. Most administrators, however, indicated that a deficit at the end of the year was usually paid from school funds. A county

health organization paid the deficit for one school lunch program where a large number of lunches were served free. Five schools showed a deficit of over 1 per cent for the year and one of .04 per cent. In these schools the income, including federal aid, was not sufficient to defray the expenses incurred for the operation of the lunch program.

Sixteen schools showed a surplus for the year which ranged from .54 to 13.59 per cent. In most of the schools administrators indicated that the surplus would be needed during the summer for repairs and replacement of equipment. Bryan stated that (18, p. 125):

> A reasonable limit in excess of any depreciation reserve is 1 to 2 per cent of sales. . .
>
> . . . A part of any surplus of the preceding year is used at the beginning of the year for inventory and wage bills which must be paid before sufficient income from food sales has accrued for this purpose, and to supply cash for the meeting of certain miscellaneous expenses such as pre-opening cleaning and decoration.

Per meal receipts and costs

Factors which seemed to have influenced the operating expenses of the school lunch programs studied have been indicated with reference to the percentage distribution of the income. To compare actual costs for the individual schools and for the three groups of schools, receipts and food, labor and other costs were reduced to a per meal basis

for 24 schools for the day observed and for 22 for the school year of 1948-49. (See Table 14.) For two schools the financial reports for the year were not available. The monetary value of the foods donated by the United States Department of Agriculture which 22 schools used on the day observed was estimated and reduced to a per meal basis; similar figures for the school year were not available.

The per meal receipts and costs for the day observed and for the year were calculated on the basis of the number of revenue lunches served. The receipts shown in Table 14 included income from lunches, banquets, milk, candy, ice cream, federal reimbursement and others. Total receipts were used in order to show the relationship between total receipts and costs since labor and other costs were not classified with reference to the labor and other expenses used for preparing and serving food for banquets and for selling other items.

Fluctuation in the average cash received per meal and the price charged pupils is explained by the price charged adults, the sale of other foods and the service of free lunches. In School 211 a majority of the students purchased ice cream and candy with their plate lunch and milk was sold to those bringing lunch.

The per meal food cost included the cost of food for lunches, excluding the cost of employees' meals and the cost

Table 14. Per Meal School Lunch Receipts and Costs in 24 Iowa School

| School | Charges Per Meal | | Reimbursement for Type A Lunch | Average Cash Received Per Meal | Lunches Served "Free" | Lunches Served On Day Observed | | |
|---|---|---|---|---|---|---|---|---|
| | Pupils | Teachers and Other Adults | | | No. | Per Meal Cost | | |
| | | | | | | Total | Food[d] | Labo |
| 230 | $ .20 | $ .25 | $ .06 | $ .256 | 3 | $ .218 | $ .137 | $ . |
| | .20 | .25 | .06 | .256 | 3 | .221 | .150 | |
| | .20 | .25 | .06 | .256 | 3 | .272 | .194 | |
| 110 | - [c] | - | 0 | .338 | 0 | .335 | .217 | |
| 111 | .30 | .30 | .06 | .373 | 0 | .367 | .202 | |
| 112 | .30 | .36 | .06 | .368 | 9 | .235 | .156 | |
| 113 | - | - | 0 | .189 | 0 | .190 | .107 | |
| 121 | .25 | .35 | .06 | .360 | 0 | .335 | .170 | |
| 122 | .20 | .30 | .06 | .256 | 20 | .207 | .116 | |
| 123 | .25 | .31 | .06 | .324 | 0 | .256 | .171 | |
| 211 | .25 | .30 | .06 | .440 | 0 | .475 | .191 | |
| 212 | - [c] | - | 0 | .285 | 0 | .298 | .243 | |
| 213 | .25 | .30 | .06 | .314 | 0 | .214 | .114 | |
| 221 | .25 | .30 | .06 | .314 | 0 | .259 | .168 | |
| 222 | .18 | .25 | .06 | .170 | 45 | .380 | .235 | |
| 223 | .25 | .25 | .06 | .287 | 12 | .213 | .134 | |
| 231 | .25 | .25 | .06 | .295 | 5 | .287 | .200 | |
| 232 | .20 | .20 | .06 | .249 | 0 | .204 | .097 | |
| 233 | .25 | .25 | .06 | .303 | 1 | .271 | .212 | |
| 234 | .20 | .20 | .06 | .238 | 10 | .175 | .104 | |
| 235 | .20 | .20 | .06 | .248 | 0 | .213 | .131 | |
| 236 | .20 | .20 | .06 | .247 | 0 | .171 | .100 | |
| 237 | .25 | .30 | .06 | .295 | 0 | .239 | .155 | |
| 238 | .20 | .20 | .06 | .260 | 0 | .154 | .093 | |
| 239[b] | - | - | - | - | - | - | - | |
| 2310 | .16 | .16 | .06 | .214 | 0 | .250 | .172 | |
| 2311 | .25 | .30 | .06 | .307 | 0 | .274 | .179 | |
| 2312 | .20 | .20 | .06 | .244 | 3 | .283 | .212 | |
| 2313 | .20 | .26 | .06 | .242 | 10 | .193 | .130 | |

[a]Financial reports for the year were not available

[b]Not able to obtain data for the day observed

[c]A la carte service

[d]Includes cos

[e]Includes cos addition to

Schools on the Day Observed and in 22 for the School Year 1948-49

| al Costs | | Estimated Value of U.S.D.A. Donated Foods Per Lunch | Lunches Served During School Year 1948-49 | | | | |
|---|---|---|---|---|---|---|---|
| Labor | Other[c] | | Average Cash Received Per Meal | Per Meal Costs | | | |
| | | | | Total | Food[d] | Labor | Other[c] |
| 7 $ .081 | $0 | $ .043 | $ .254 | $ .247 | $ .160 | $ .076 | $ .011 |
| 0 .071 | 0 | .028 | | | | | |
| 4 .078 | 0 | .021 | | | | | |
| 7 .091 | .027 | 0 | .371 | .365 | .223 | .102 | .030 |
| 2 .138 | .027 | .027 | .468 | .481 | .235 | .192 | .054 |
| 6 .076 | .003 | .045 | - | - [a] | - | - | - |
| 7 .073 | .010 | 0 | .200 | .196 | .098 | .070 | .028 |
| 0 .116 | .049 | .010 | .388 | .370 | .178 | .134 | .058 |
| 6 .082 | .009 | .030 | .235 | .214 | .115 | .085 | .014 |
| 1 .071 | .014 | .016 | .264 | .244 | .129 | .073 | .042 |
| 1 .206 | .078 | .039 | .385 | .360 | .132 | .106 | .122 |
| 3 .048 | .007 | 0 | .400 | .379 | .251 | .076 | .052 |
| 4 .100 | 0 | .025 | - [a] | - | - | - | - |
| 8 .087 | .004 | .053 | .312 | .302 | .158 | .112 | .032 |
| 5 .077 | .068 | .016 | .157 | .157 | .072 | .038 | .047 |
| 4 .079 | 0 | .066 | .318 | .275 | .173 | .097 | .005 |
| 0 .085 | .002 | .033 | .283 | .278 | .164 | .082 | .032 |
| 7 .107 | 0 | .039 | .248 | .240 | .111 | .112 | .017 |
| 2 .056 | .003 | .048 | .299 | .280 | .187 | .064 | .029 |
| 4 .071 | 0 | .066 | .241 | .235 | .159 | .075 | .001 |
| 1 .082 | 0 | .031 | .236 | .231 | .136 | .088 | .007 |
| 0 .071 | 0 | .058 | .207 | .225 | .119 | .102 | .004 |
| 5 .084 | 0 | .053 | .306 | .310 | .186 | .083 | .041 |
| 3 .061 | 0 | .037 | .251 | .250 | .144 | .068 | .038 |
| - | - | 0 | .230 | .245 | .131 | .094 | .020 |
| 2 .078 | 0 | .022 | .222 | .219 | .125 | .088 | .006 |
| 9 .095 | 0 | .043 | - [a] | - | - | - | - |
| 2 .071 | .001 | .020 | .213 | .217 | .155 | .055 | .007 |
| 0 .063 | 0 | .049 | .245 | .242 | .150 | .073 | .019 |

es cost of food used for lunches

es cost of food used for banquets, milk sold separately, candy and ice cream in
on to other expenses not classified as food or labor

of food used for banquets and the milk, ice cream and candy sold in addition to the lunch. Labor cost included the wages paid, the cost of employees' meals and the amount paid from school lunch funds for Iowa Old Age and Survivors Insurance. Other costs included the cost of food used for banquets, food items sold in addition to the lunch and other operating expenses.

In School 111, where the per meal receipts and costs for the year exceeded those for the day observed, it was possible that prices were increased during the school year and that income and expenses for food served for special occasions was not reported as such on the financial records. Milk was sold in this school in addition to that included with the plate lunch.

The per meal costs and receipts for the school year are discussed and compared since those for the day might not have been typical; in 11 schools costs other than for food and labor were not reported on the day observed while the financial report for the year indicated additional items of expense.

The average per meal receipts and costs for the three groups of schools and for 22 schools are shown in Table 15. In this table the per meal receipts from lunches sold excluded federal reimbursement. Total per meal receipts included all cash income received for the operation of the

lunch program. These figures do not include the monetary value of the commodities donated by the United States Department of Agriculture. Two of the high schools did not receive federal aid.

The average total cash received per revenue lunch served during the school year in 22 Iowa schools was 27.3 cents and varied from 15.7 to 46.8 cents in the individual schools. Dreisbach and Handy (25) reported that the average cash income per lunch served for a period of three months or longer in 34 schools was 24 cents; for the individual schools the range was from 11.6 to 34.7 cents. These lower

Table 15. Average Per Meal Receipts and Costs for the Three Groups of Iowa Schools During 1948-49

| Groups of Schools | Per Meal Receipts | | Per Meal Costs | | | |
|---|---|---|---|---|---|---|
| | From Lunches Sold | Total | Total | Food | Labor | Other |
| High schools | $ .256 | $ .325 | $ .316 | $ .171 | $ .095 | $ .050 |
| Elementary schools | .192 | .262 | .244 | .128 | .083 | .033 |
| Schools with 12 grades | .195 | .248 | .246 | .151 | .078 | .017 |
| Total schools | .211 | .273 | .265 | .151 | .084 | .030 |

figures could be expected since they were determined on the basis of the total number of meals served rather than on the number of revenue lunches served. The total per meal receipts for the Iowa schools included receipts for items

other than from lunches sold such as candy, ice cream and milk.

In the three groups of Iowa schools the total cash receipts per meal served ranged from 20 to 46.8 cents, 15.7 to 38.8 and 20.7 to 30.6 in the high schools, elementary schools and schools with 12 grades. There was wide variation among schools within a group, particularly the high schools. The receipts for some of the schools in this group included income from banquets and the sale of additional food items. Few meals were served free and two of the four schools did not receive reimbursement from National School Lunch Program funds.

The average per meal total cost for the year 1948-49 in 22 Iowa schools was 26.5 cents and the range for the individual schools was from 15.7 to 48.1 cents. For 34 schools Dreisbach and Handy (25) found that the average per meal cost for three months or a longer period varied for the individual schools from 12 to 35.5 cents. The total per meal costs for the Iowa schools included cost of items sold in addition to the lunch; this might have accounted for the costs being higher than those reported in the study cited.

As indicated by analysis of covariance, there were differences between the three groups of schools when the

total costs for the year for 22 Iowa schools were adjusted to a common mean number of revenue lunches served during the year. (See Appendix E, Table 26.)

The average total cost per revenue lunch served was approximately 7 cents higher for the high schools than for the elementary schools and schools with 12 grades. The range of costs was from 19.6 to 48.1 cents, 15.7 to 37 and 21.7 to 31 in the high schools, elementary schools and schools with 12 grades respectively. In two of the high schools large quantities of candy, ice cream and milk were sold in addition to the plate lunch; this increased other costs. Labor costs were highest in the high schools.

The average per meal cost of the food used for lunches in 22 Iowa schools during 1948-49 was 15.1 cents and varied from 7.2 to 25.1 cents for the individual schools. Dreisbach and Handy (25) reported that for a period of three months or longer the average per meal food cost in 34 schools was 16 cents and the range was from 9.8 to 25.8 cents in the individual schools. Waye (129) found that the per meal food costs in 62 Ohio schools varied from 12 to 26 cents and averaged 18. The latter study was conducted in 1951 and the increase in food prices might have accounted in part for the higher per meal food cost in these schools.

James (46) found that the average food cost per revenue lunch served in one rural Iowa school during April, 1948,

varied from 9.6 to 18.6 cents; the median was 15.6. For May, 1948, the food costs varied from 10.7 to 19.8 cents and the median was 15.8. The median costs coincided to some extent with the average for the schools studied in the present research.

Analysis of covariance indicated that when the food costs for the year for 22 schools were adjusted to a common mean number of revenue lunches served during the year, differences between the three groups of schools were not significant. (See Appendix E, Table 27.)

The average per meal food costs for the high schools, the elementary schools and schools with 12 grades were 17.1, 12.8 and 15.1 cents respectively. There was wide variation, however, in costs among schools within a group; in the three groups of schools costs varied from 19.6 to 48.1 cents, 15.7 to 37.9 and 21.7 to 28.

In addition to the number of lunches served, the amount and type of foods served in individual schools accounted for some of the variation in per meal food costs. (See Appendix D, Table 20.) Other factors which would affect the cost of food were the differences in food prices in various communities and the amounts of the commodities donated by the United States Department of Agriculture which were used during the school year. Some schools received a greater variety of foods than others and in some the personnel made

optimum use of the donated foods. Two high schools were not receiving federal aid; in one the per meal food cost was second from the lowest for all schools, in the other the cost was highest.

The average per meal labor cost for 22 Iowa schools was 8.4 cents and the costs for the individual schools varied from 3.8 to 19.2 cents. Dreisbach and Handy (25) reported an average per meal labor cost of 6 cents in 34 schools; the range was from 2.2 to 10.7 cents. Their costs did not include the cost of employees' meals or insurance and this might have accounted for the lower average cost. The average per meal labor costs in 62 Ohio schools varied with the number served (129):

| Number Served | Per Meal Labor Cost |
|---|---|
| Less than 100 | $ .103 |
| 100-200 | .070 |
| More than 200 | .056 |

For 32 days in April and May, 1948, James (46) found that the per meal labor cost in one rural Iowa school with 12 grades varied from 6.8 to 8.2 cents; the median was 7.4 cents. This variation was attributed to fluctuation in the number served daily. The costs were determined on the same basis as was used in the present study and the median coincided with the average per meal labor time reported for the schools with 12 grades, 7.8 cents.

When the labor costs for the year for 22 Iowa schools were adjusted to a common mean number of revenue lunches served during the year, analysis of covariance showed that there were significant differences between the three groups of schools. (See Appendix E, Table 28.)

The average per meal labor costs for the high schools, elementary schools and schools with 12 grades were 9.5, 8.3 and 7.8 cents respectively. The range in costs for the individual schools in each of these groups was from 7 to 19.2 cents, 3.8 to 13.4 and from 5.5 to 11.2.

Other than the number of lunches served, factors which influenced the variation in per meal labor costs between the three groups of schools were the number of employees, the amount of wages paid and the number of special functions requiring additional wages. In general the employees in the high schools and elementary schools in larger cities received higher wages and were paid over-time for preparing and serving food for banquets. In School 111, where the per meal labor time was the highest, there were three full-time and six part-time employees. The part-time workers were paid by the hour and no student workers were employed. The per meal labor time as well as per meal labor cost in this school was relatively high.

Other costs in the 22 schools varied from .1 to 5.8 cents and averaged 3 cents per lunch served. Analysis of

covariance indicated that when the other costs for the year for 22 schools were adjusted to a common mean number of revenue lunches served during the year, differences between the three groups of schools were highly significant. (See Appendix E, Table 29.)

In the high schools, where other costs were highest, the average was 5 cents and the range was from 3 to 12.2 cents per revenue lunch served. The average for the elementary schools was 3.3 cents and the costs varied from 1.4 to 5.8 cents. In the schools with 12 grades the average costs for other items were considerably lower, 1.7 cents per lunch served; the range was from .1 to 4.1 cents.

The variation in the amount and type of operating expenses paid from school lunch funds and the amount and kind of items purchased other than food for lunches were factors which affected the total per meal other costs. More operating expenses were paid from school lunch income in the high schools and the elementary schools in the larger cities and milk, candy and ice cream in addition to food for banquets were sold in some of these schools. Few items other than food for the school lunch were purchased in the schools with 12 grades and the operating expenses were limited. In general the per meal receipts and costs for the lunches served in 22 Iowa schools for the school year 1948-49 were similar to those reported by other investigators.

The contribution of federal aid

When the average cash receipts per lunch sold in 20 schools which received aid from the National School Lunch Program were compared with the per meal food and labor costs, there was evidence that without reimbursement the expenses would exceed the income. For the 20 schools and for the three groups of schools the average cost of food and labor totaled more than the income received from lunches sold:

| Groups of Schools | Receipts per Lunch Sold | Per Meal Food Cost | Per Meal Labor Cost |
|---|---|---|---|
| High schools | $ .300 | $ .194 | $ .157 |
| Elementary schools | .192 | .128 | .083 |
| Schools with 12 grades | .195 | .151 | .078 |
| Total schools | .203 | .147 | .087 |

The United States Production and Marketing Administration (125) reported that during 1949 the average total cost of preparing and serving a lunch in schools receiving reimbursement was 20 cents; the average cash receipts for lunches sold was 14 cents. This was 6 cents lower than the average cash receipts for lunches in 20 Iowa schools during the school year of 1948-49; 14.8 per cent of all lunches served were free while in the Iowa schools only 6.24 per cent were free.

The average per meal monetary value of the United States Department of Agriculture commodities used in the 20 schools

during the school year was not available for 1948-49. The average per meal value of commodities used for the day observed was 3.6 cents and the averages for each of the three groups of schools were 4, 3.1 and 3.7 cents; the amounts varied in the individual schools from .9 to 8 cents. (See Table 14.) James (46) found that in a rural Iowa school for a period of 32 days, the average per meal value of commodities used was 4 cents.

In the present research the average cost of the food per revenue lunch served in 20 Iowa schools participating in the National School Lunch Program was 14.7 cents. If 3.6 cents per meal could be considered typical of the per meal value of federal commodities used during the year, that amount would represent approximately one fifth of the total monetary value of the food used in the lunches. With 3.6 cents as the per meal value of the commodities used and the reimbursement of 6 cents per lunch, the federal aid amounted to an average of 9.6 cents which was approximately 50 per cent of the average per meal cash receipts per revenue lunch served. These findings agreed with those reported by Augustine and others (6) when they summarized the data obtained by James (46) and Laughlin (58) during the pilot study which preceded the present research.

## Acceptability of Foods Served

Augustine and others (6) stated that differences found in the nutritional adequacy of the lunches served and consumed indicated that plate waste should be considered when evaluating a school lunch.

To determine the total amounts of each food returned by students in 24 Iowa schools studied, the weight of all food items served and returned were recorded. The per cent of each food consumed and the number of ounces of food returned per student served were calculated. (See Appendix D, Table 18.)

In 24 Iowa schools an average of .94 ounce of food was returned per person served or an average of 5.9 pounds and a range of 11 ounces to 20.6 pounds per 100 students served. This corresponds to the findings of Dreisbach and Handy (25) of an average of 6 pounds and a range of 5 ounces to 20 pounds.

Students in the high schools returned the least amount of food per person served and pupils in the elementary schools the greatest. In the high schools the average weight of food returned per student served was .27 ounce and the amount varied from .11 to 1.44 ounces. Of the total amount of food served in the elementary schools, an average of 1.44 ounces per person served was returned; the range was from

.32 to 1.98 ounces. In the schools with 12 grades an average of 1.22 ounces of food was returned per person served and the range was from .22 to 3.31 ounces.

Kitchin (53) reported that the average amount of food returned per pupil served in an elementary Texas school over a period of nine weeks was .6 ounce. Wilson (133) found that in ten elementary schools in Alabama, 1.8 ounces of food was returned per lunch served and the range was from .6 to 4.5 ounces. She reported that the average daily amount returned per student was 1.6 ounces in the rural schools, 1.7 ounces in the urban schools offering a choice of foods and 2.5 ounces in urban schools serving plate lunches. Kennedy (50) indicated that the weights of food returned in three elementary schools on the day observed were .75, 1.07 and 2.53 ounces per student served.

Augustine and others (6) reported that students in grades one through six returned more food per person served than did those in grades seven through 12. They found that in general the amount of food returned per student served was less than one half ounce for a single menu item and was frequently less than one tenth of an ounce. The amount of food returned per person served in 24 Iowa schools exceeded one half ounce for only seven menu items, one served in the high schools, four in the elementary schools and two in the schools with 12 grades. No food was returned in amounts exceeding 1 ounce

per person served. (See Appendix D, Table 18.)

Of the total amount of food served to students in 24 Iowa schools, 5.08 per cent was returned; the range was from .50 to 13.63 per cent. In the high schools 2.41 per cent was returned, in the elementary schools 6.34 and in the schools with 12 grades 5.49. The percentages for the individual schools in each of the three groups ranged from .50 to 4.82, 1.40 to 9.09 and .94 to 13.63. These percentages were slightly lower than that reported by Boren (13). She found that 7 per cent of the food served per person in a small school lunchroom in Texas was returned.

In two of the Iowa high schools a choice of food items was offered. In these schools and in one high school where a Type A lunch was served, less than 1 per cent of the food was returned. In these three schools the food was well prepared and attractively served. A menu item unfamiliar to the students, jellied cranberry salad, was served in the high school where the highest per cent of food was returned and many of the students ate less than one third of the portion served.

Children in most of the elementary schools were usually expected to accept a portion of each menu item offered. In some of these schools the personnel regulated the size of portion according to the age of the children and their usual food habits. Small portions were served in these schools

and more pupils requested second portions than in schools where large portions were served. Pupils were supervised during the lunch period and urged to eat all of the food served to them. In the elementary school where the largest percentage of food was returned for that group of schools, large portions of all menu items were served. Little attention was paid to the arrangement of the food on the plates. Pupils made comments about the unattractive appearance and the fact that foods were mixed together. Teachers did not eat with or supervise pupils during the lunch period.

Students in the schools with 12 grades frequently were permitted to have some choice of the kind and amount of each menu item served although a Type A lunch was offered. In the school where only .94 per cent of the food was returned, the food was well prepared and the menu items were those that had been served regularly. The elementary students in this school were served small portions and teachers urged them to eat everything. All students were expected to accept every food item and to eat all of the food served to them. In the school with 12 grades where there was the greatest percentage of food returned, the portions of the main dish item were large. Food was served on sectioned metal trays and there was a tendency for the workers to fill the sections with too much food for the younger children. Students were not supervised during the lunch period.

The average percentage of eight types of food returned in three groups of schools and the total percentage of food returned in all schools are shown in Figure 2. To determine the general kinds of foods returned in greatest quantities in each of the groups of schools and for the 24 schools, the menu items were classified into eight types of foods. Salads included both vegetable and fruit salads and any vegetable served raw if another vegetable had been included on the menu. The vegetables included all cooked vegetables and raw vegetables if no cooked ones were served. If potatoes were served as a part of the main dish, they were included with that item. The main dish items represented the main protein food of the meal. Sandwiches which contained cheese, peanut butter or other protein were classified with other breads and sandwiches. Desserts did not include raw and canned fruits served as desserts; these fruits were classified in a separate group. The fruit juice was either orange, grapefruit or a mixture of the two.

For the 24 schools, salads and vegetables were returned in greatest amounts. Desserts, main dish items, breads and sandwiches, milk, fruits and fruit juices were returned in the order of decreasing amounts. The two types of food returned in greatest amounts in 24 Iowa schools were the same as those reported by Dreisbach and Handy (25), Laughlin (58), Lynn (62) and Jenkins (47). Contrary to the findings

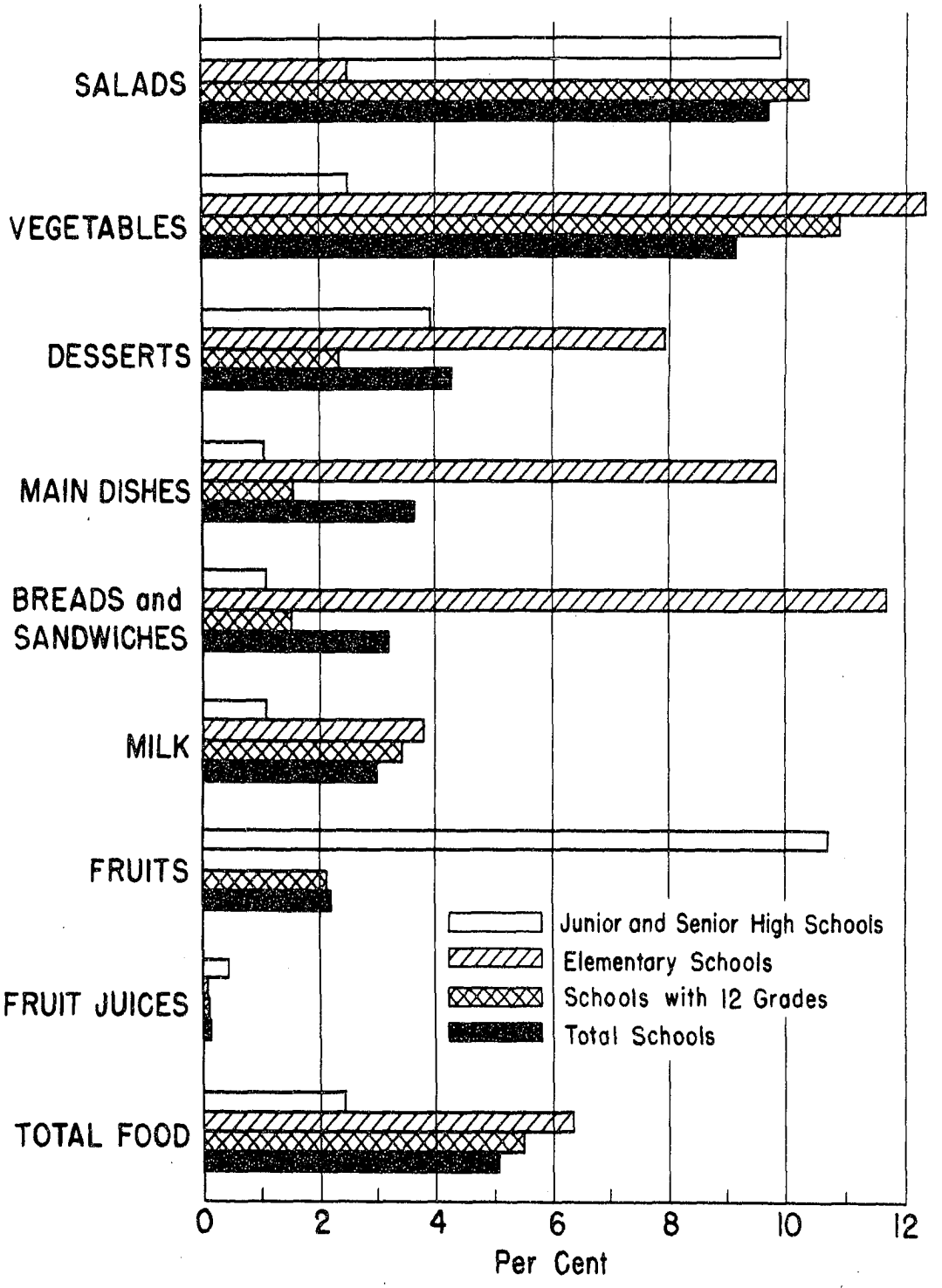


**Fig. 2 Per Cent of Served Food Returned in 24 Iowa Schools on the Day Observed**

of the present study, these investigators found that desserts were returned in smaller amounts than were main dish items.

In each of 24 Iowa schools the appearance and flavor of the menu items served were evaluated subjectively by the investigator using scores ranging from five to one. Few items were rated three or below for flavor; more items presented an unfavorable appearance due to color or the arrangement on the plate. Vegetables were most frequently rated low because of poor color and lack of seasoning. Some vegetables had been cooked and stirred for long periods of time. Raw vegetables and salads were not always crisp and cold.

Of the amount of salads served in 24 schools, 9.67 per cent was returned and 9.88, 2.42 and 10.40 per cent were returned in the high schools, elementary schools and schools with 12 grades respectively. The kind of salads served and the percentage returned are compared:

| Salads | High Schools | Elementary Schools | Schools With 12 Grades |
|---|---|---|---|
| Carrot Sticks | | | 35.54 |
| Jellied Cranberry Salad | 24.88 | | |
| Cabbage Salad | | | 22.03 |
| Cabbage and Carrot Salad | | | 17.03 |
| Celery Sticks | 12.50 | | |
| Cole Slaw | | | 10.19 |
| Jellied Cabbage and Carrot Salad | | | 6.63 |
| Fruit Gelatin Salad | 4.79 | | |
| Cabbage and Carrot Salad | | | 4.17 |
| Apple Salad | 3.92 | | |
| Carrot Sticks | | | 3.22 |
| Carrot and Celery Sticks | | 2.63 | |
| Carrot Sticks | | | 2.73 |
| Raw Cabbage | | 2.08 | |
| Cole Slaw | 1.72 | | |
| Cabbage and Carrot Salad | 1.32 | | |
| Carrot Sticks | | | .72 |

In most instances a large number of pupils left only small amounts of the salads containing vegetables or fruit cut into small pieces. There was wide variation in the percentage of raw carrots and celery returned; the salad returned in the greatest and smallest amounts in the schools with 12 grades was raw carrots. The nine salads served in these schools contained either raw carrots or cabbage or both.

Of the vegetables served in the 24 schools, 9.13 per cent was returned. The high schools, elementary schools and schools with 12 grades returned 2.50, 12.32 and 10.94 per cent respectively. The kinds of vegetables served and the percentage returned are compared:

| Vegetables | High Schools | Elementary Schools | Schools With 12 Grades |
|---|---|---|---|
| Canned Peas | | 44.27 | |
| Stewed Tomatoes | | 26.34 | |
| Breaded Tomatoes | | | 19.11 |
| Buttered Beans | | | 16.00 |
| Creamed Peas | | | 14.17 |
| Baked Potatoes | | | 13.74 |
| Spinach | | 12.15 | |
| Creamed Potatoes | | | 10.40 |
| Raw Celery | | 9.70 | |
| Stewed Tomatoes | | 8.98 | |
| Green Beans | | | 8.96 |
| Buttered Green Beans | | 8.28 | |
| Canned Dried Lima Beans | | | 5.57 |
| Harvard Beets | | | 4.93 |
| Creamed Potatoes | | | 3.87 |
| Creamed Peas | 3.53 | | |
| Canned Peas | 2.84 | | |
| Mashed Potatoes | 1.50 | | |
| Potato Chips | 1.04 | | |
| Canned Peas | .89 | | |
| Mashed Potatoes | .22 | | |

High school students accepted vegetables better than students in the other two groups of schools. Portions served in the elementary schools were usually 2 ounces or less. In general when the average portion served exceeded 3.5 ounces, some of the vegetable was returned. (See Appendix D, Table 18.) Of the canned peas served in three schools, .89, 2.84 and 44.27 per cent were returned. Of the creamed peas served in two schools, 3.53 and 14.17 per cent were returned. In both instances the high school students returned less than the students in the other schools.

Vegetables of similar types were not accepted to the same degree in all schools; students returned large amounts

in some schools and smaller amounts in other schools of the same vegetable. Stewed tomatoes were served in two elementary schools and 8.98 and 26.34 per cent were returned.

In the school where the largest amount of vegetable was returned, average portions of the vegetable were less than 1.5 ounces. Large portions of other foods were served in this school and the plate did not present an attractive appearance. Pupils were not urged to eat their entire lunch and large amounts of all foods served were returned.

Of the total amount of desserts served in 24 schools, 4.31 per cent was returned; the students in the high schools, elementary schools and schools with 12 grades returned 3.98, 7.94 and 2.30 per cent respectively. The kinds of desserts served and the percentage returned are compared:

| Desserts | High Schools | Elementary Schools | Schools With 12 Grades |
|---|---|---|---|
| Apple Crisp | | 22.85 | |
| White Cake with Cherry Sauce | 10.59 | | |
| Fruit Gelatin | | 10.33 | |
| Fruit Gelatin | | 10.22 | |
| Gingerbread | | | 8.75 |
| Gingerbread | | 7.85 | |
| Apple Crisp with Whipped Cream | | 4.62 | |
| White Cake with Brown Sugar Sauce | 4.38 | | |
| Apple Sauce Cake with Icing | | | 4.10 |
| Chocolate Ice Box Cooky | | | 3.57 |
| Chocolate Pudding | | | 3.37 |
| Fruit Gelatin | 2.94 | | |
| Apple Crisp | | | 2.74 |
| Bread Pudding with Vanilla Sauce | 1.07 | | |
| Fruit Gelatin | | | 1.05 |
| Fruit Gelatin | | 1.00 | |

| Desserts | High Schools | Elementary Schools | Schools With 12 Grades |
|---|---|---|---|
| Peanut Butter Cooky | | | .96 |
| Spice Cake | | | .60 |
| Frosted Graham Cracker | | | .30 |
| Banana Orange Custard | | | .25 |
| Chocolate Cake | .00 | | |

In general where large amounts of desserts were returned, other menu items served in the same school were returned in relatively large amounts. Large amounts of desserts were returned in most of the elementary schools, although portions were not excessively large. In one high school 10.59 per cent of the white cake with cherry sauce and in another 4.38 per cent of the white cake with brown sugar sauce were returned. Some of the students indicated that they preferred icing to sauce on the cake.

The percentage of apple crisp returned in one elementary school was more than double that of any other dessert. In this school large amounts of other foods were returned. In two other schools the percentage of apple crisp returned was relatively low. Fruit gelatin served in five schools was returned in amounts which ranged from 1 to 10.33 per cent. The percentage of gingerbread returned in one elementary school and one school with 12 grades were similar.

Three and seven tenths per cent of the total amount of main dish items served in 24 schools was returned. In the high schools, elementary schools and schools with 12 grades

1.08, 9.87 and 1.53 per cent were returned. The kinds of main dish items served in 24 schools and the percentage returned are compared:

| Main Dish Items | High Schools | Elementary Schools | Schools With 12 Grades |
|---|---|---|---|
| Cheese | | | 32.81 |
| Beef and Noodles | | | 22.32 |
| Beef and Noodles | | 20.19 | |
| Navy Beans with Ham | | 16.15 | |
| Hard Cooked Egg and Cheese | | | 15.59 |
| Potato Soup with Crackers | | 14.96 | |
| Meat Loaf | | | 10.56 |
| Baked Beef Hash | | | 10.29 |
| Creamed Canned Turkey | | | 9.81 |
| Creole Spaghetti | | | 9.35 |
| Macaroni and Cheese | | | 7.52 |
| Cheese | | | 6.99 |
| Baked Hash | | 6.83 | |
| Spaghetti with Tomato Sauce and Cheese | | 6.70 | |
| Baked Beans | | | 3.33 |
| Creamed Chicken | | | 2.81 |
| Beefburger and Bun | 2.23 | | |
| Beef and Gravy | | 2.09 | |
| Toasted Cheese on Bun | 1.49 | | |
| Barbecued Hamburger and Bun | 1.25 | | |
| Spam | | | .80 |
| Scalloped Ham and Noodles | .50 | | |
| Baked Beans | .07 | | |
| Hot Roast Beef Sandwich | .00 | | |

Cheese had been used often during the year since it was one of the commodities supplied; in the school where almost one third was returned, the students said they were tired of it. In both of the schools where beef and noodles were served, the writer observed that the younger children had some difficulty picking up the noodles with a fork or spoon. This may have accounted for the high amount returned; beef and

noodles were returned in the second and third largest amounts.

Of the total amount of breads and sandwiches served in 24 schools, 3.24 per cent was returned; 1.08, 11.71 and 1.57 per cent were returned in the high schools, elementary schools and schools with 12 grades respectively. The kind of sandwiches served and the percentage returned are compared:

| Sandwiches | High Schools | Elementary Schools | Schools With 12 Grades |
|---|---|---|---|
| Cheese | | 17.55 | |
| Peanut Butter and Dried Fruit | | | 10.86 |
| Bread, Butter and Margarine | | | 10.33 |
| Bread and Margarine | | | 9.86 |
| Cornbread, Honey and Margarine | | 9.60 | |
| Peanut Butter | | | 7.30 |
| Bread and Margarine | | | 6.93 |
| Peanut Butter | | 6.13 | |
| Bread and Butter | | | 4.40 |
| Bread and Butter | | | 4.11 |
| Bread, Butter and Honey | | 3.94 | |
| Peanut Butter | | | 3.61 |
| Bread and Margarine | | 3.38 | |
| Bread and Margarine | | 3.13 | |
| Parker House Rolls and Margarine | | | 2.23 |
| Peanut Butter | | | 1.93 |
| Bread and Margarine | 1.66 | | |
| Peanut Butter | | | .45 |
| Peanut Butter and Honey | | | .42 |
| Bakery Bun and Butter | .00 | | |
| Peanut Butter | .00 | | |

Whether the sandwiches included a protein food or only table fat seemed to make little difference in the percentage returned. The elementary students in the two groups of schools usually returned the crusts of the bread. In the school where 17.55 per cent of the cheese sandwiches was returned,

a relatively large percentage of all food items served was returned. Older pupils in the schools usually accepted double portions of sandwiches or breads. In some schools they were permitted to take only two sandwiches but could return for second portions. Some of the older boys in other schools picked up four or more sandwiches and often some of these were returned. This may have accounted for the high percentage of sandwiches and bread returned in the schools with 12 grades. The peanut butter and dried fruit sandwich was an item unfamiliar to the students and those who ate the sandwich did so only after being told what was mixed with the peanut butter.

Three per cent of the milk served in the 24 schools was returned; the high schools, elementary schools and schools with 12 grades returned 1.03, 3.80 and 3.43 per cent respectively. The total amount of milk served was consumed in only one elementary school and two high schools. Less milk was returned in those schools where teachers supervised the students during the lunch period and urged them to drink milk. Several students in the high schools did not accept milk with their lunches. An average of three ounces or more of milk was returned per student returning that item in seven schools. (See Appendix D, Table 18.)

Of the total amount of fruit served in the schools, 2.26 per cent was returned. Fruit was served in only one

high school where a fruit ball made of dried fruits and honey was served as part of the dessert; this was a new item, unfamiliar to the students and 10.77 per cent was returned.

No fruits were served in the elementary schools. In the schools with 12 grades 2.16 per cent of the fruit served was returned. Apples and canned pears, applesauce and plums were each served once as a dessert and canned peaches twice. The percentage returned ranged from 1.64 for canned peaches to 2.80 for canned plums.

Orange juice, grapefruit juice or a mixture of the two were served in 16 schools and completely consumed in 11. Of the total amount of fruit juice served, .17 per cent was returned; high school students returned .44, elementary students .06 and students in schools with 12 grades .17 per cent.

The appearance of the food, the flavor and the size of the portion served seemed to affect the amount of food consumed by children in 24 Iowa schools. Foods unfamiliar to students were not well accepted. In those schools where students were supervised during the lunch period there usually was less food returned. Foods difficult to manage such as vegetables and fruits cut into small pieces and noodles were returned by elementary students. The least amount of food was returned in the two high schools where

a choice of menu items was offered. Wide variation among schools in the amounts of foods of the same kind returned indicated that there are other factors, not determined in the present study, which influenced the acceptability of the food served.

In general the amounts and kinds of foods returned by students in the Iowa schools studied were similar to those reported by other investigators.

## Nutritive Value of the School Lunches

A school lunch is considered adequate if it supplies at least one third of a child's daily nutritional allowances as recommended by the National Research Council (69). Studies have been conducted in some schools to determine the nutritive value of the average amount of food served or consumed. The present study, however, was concerned with the nutritive value provided by a standard portion of each food item in the menu and of the total lunch prepared in order to determine whether the lunches planned and prepared were nutritionally adequate.

All ingredients used in the preparation of the lunch in each school on the day observed were weighed as were the total amounts of all menu items prepared. The amounts of each of nine nutrients provided by every menu item were

calculated using the food composition tables compiled by the United States Department of Agriculture (128). To determine the nutritive values of a standard portion of each food item, the total value of each of the nutrients supplied by the food item was divided by the number of standard portions prepared. The amounts of each nutrient provided by the standard portion of the menu item prepared were totaled to show the nutritive value afforded by the complete lunch. (See Appendix D, Table 19.) These totals indicated whether the kinds and amounts of certain foods used in the preparation and service of the lunch were adequate to meet the nutritional standards.

The nutritional adequacy of a standard portion of each menu item and of the total lunch prepared were determined on the basis of the percentage which each supplied of the daily nutritional allowances recommended by the National Research Council (76) for a child 10 to 12 years old. These percentages for every menu item and the total lunch for each of 24 schools are shown in Appendix D, Table 20.

The average percentage of the daily nutritional allowances supplied by standard portions of the menu items in the complete lunches were calculated for the 24 Iowa schools and for the three groups of schools:

| Nutrient | Total Schools | High Schools | Elementary Schools | Schools With 12 Grades |
|---|---|---|---|---|
| Calories | 30.56 | 35.60 | 26.89 | 29.84 |
| Protein | 37.28 | 41.16 | 32.86 | 37.43 |
| Calcium | 37.08 | 38.08 | 33.75 | 38.25 |
| Iron | 32.50 | 37.50 | 28.33 | 32.50 |
| Vitamin A | 47.00 | 32.16 | 47.04 | 54.42 |
| Thiamine | 35.83 | 43.33 | 31.67 | 35.00 |
| Riboflavin | 38.33 | 40.55 | 36.67 | 38.33 |
| Niacin | 39.17 | 39.17 | 32.50 | 42.50 |
| Ascorbic Acid | 57.33 | 49.33 | 53.33 | 64.00 |

One third of the daily allowances for a child 10 to 12 years old were met by the average amount of nutrients supplied by the lunches prepared in 24 schools except for calories and iron. On the basis of this standard vitamin A was inadequate in the high school lunches, calories, protein, iron, thiamine and niacin in the elementary school lunches, and calories and iron in the lunches in the schools with 12 grades. Dietary allowances for children from ten to twelve years have been used by other investigators as the basis for evaluating the nutritional adequacy of school lunches and were used in the present study for comparison.

When the nutritional adequacy of the lunches prepared in the high schools was determined on the basis of the dietary allowances for boys from 13 to 15 years old and in the elementary schools for children from seven to nine years old, the findings were somewhat different than when the allowances for children from ten to twelve years old were used:

| Nutrient | High Schools | Elementary Schools |
|---|---|---|
| Calories | 27.81 | 33.60 |
| Protein | 34.23 | 38.33 |
| Calcium | 32.64 | 40.50 |
| Iron | 30.00 | 34.00 |
| Vitamin A | 28.94 | 60.48 |
| Thiamine | 34.67 | 38.00 |
| Riboflavin | 36.50 | 44.00 |
| Niacin | 31.33 | 39.00 |
| Ascorbic Acid | 41.11 | 66.67 |

On these bases average amounts of all nutrients were adequate for the elementary schools while only protein, thiamine, riboflavin and ascorbic acid were adequate for the high schools.

In the total group of 24 Iowa schools the average lunch served provided a greater proportion of the daily allowances than the average lunch served in a Cumberland, Maryland school (127). In that school vitamin A, ascorbic acid and calcium were the only nutrients supplied in quantities equal to or greater than one third of the daily nutritional allowances for children ten to 12 years old.

The percentage of the daily nutritional allowances supplied by the lunch prepared in each individual school presented a more representative picture of the nutritional deficiencies of the lunches served in the Iowa schools. The nutrients provided by each of the 24 Iowa school lunches in relation to the recommended daily dietary allowances for children ten to 12 years old are shown in Figure 3. For

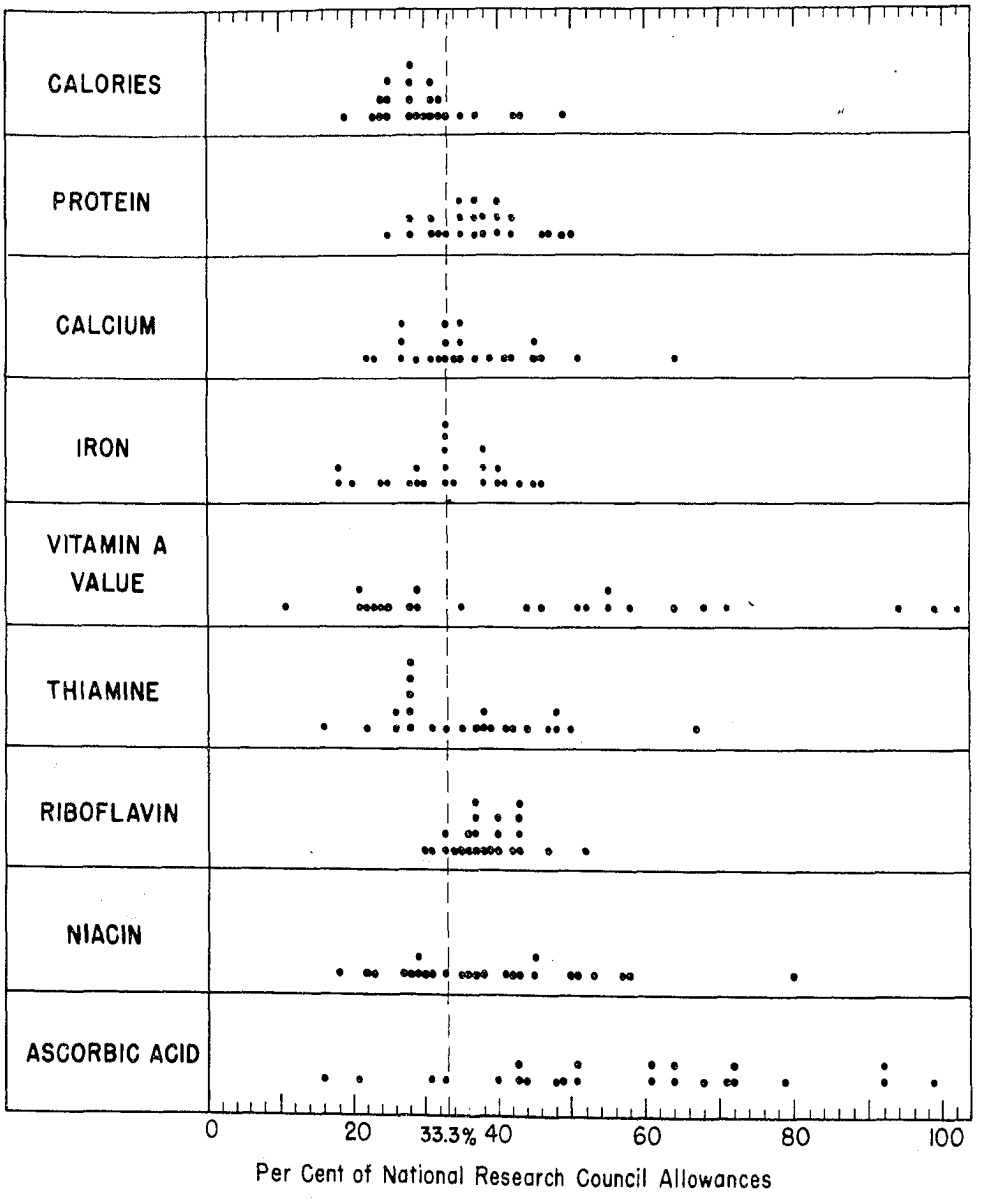


Fig. 3 Nutritive Values of 24 School Lunches as Related to the National Research Council's Recommended Daily Dietary Allowances for Children from 10 to 12 Years old

the calories and eight nutrients each dot indicates the percentage of the daily dietary allowances supplied by a school lunch. Calories were most often deficient in the 24 lunches studied while ascorbic acid was least often deficient:

| Nutrients | Number of Lunches |
|---|---|
| Calories | 19 |
| Iron | 13 |
| Thiamine | 10 |
| Vitamin A | 10 |
| Niacin | 10 |
| Calcium | 9 |
| Protein | 7 |
| Riboflavin | 4 |
| Ascorbic Acid | 3 |

Dreisbach and Handy (25) determined the nutritive value per average portion served and found that riboflavin was adequate in all of the 39 lunches studied. Lunches served in 28 schools provided one third or more of the protein required; only 13 lunches afforded one third or more of the required number of calories. James (46) found that in 20 lunches served in one school, vitamin A was inadequate more frequently than other nutrients; all lunches were high in ascorbic acid due to the citrus fruit juice which was a donated commodity. Stenborn (96) found that in the lunches served in 12 Colorado schools, every lunch was deficient in calories and ascorbic acid; riboflavin and vitamin A were above the recommended amounts for every school while niacin was adequate for all except one.

Although calories were deficient in a majority of the lunches prepared in 24 Iowa schools, the amount of calories actually consumed was presumably higher than the amount provided by standard portions of the food prepared; in most schools the older children ate more than a standard portion of bread and sandwiches and of some other food items. (See Appendix D, Table 18.) On the other hand desserts were returned in relatively large amounts in some schools; this would decrease the number of calories consumed.

Adequate protein was provided in 17 lunches. The protein in several lunches was provided by foods other than meat; this accounted in part for more of the lunches being inadequate in iron, thiamine and niacin. Fourteen lunches supplied adequate amounts of vitamin A; the salads and vegetables, however, which supplied some of this vitamin were the foods returned in largest amounts. Eight ounces of milk were provided with the lunch in most of the schools. The amount of calcium supplied by the portion of milk was only slightly more than one fifth of the daily allowance for children ten to 12 years old. In the lunches where the calcium was inadequate, milk or other sources of calcium were rarely used in the preparation of other food items in the lunch. Adequate amounts of ascorbic acid were provided by orange juice and grapefruit juice, commodities donated

by the United States Department of Agriculture.

Velat and others (127) suggested that because of the margin of differences between analyzed and calculated values of certain nutrients in foods, lunches should be planned which supply at least one half of the allowances of thiamine and ascorbic acid. Only two of the lunches served on the day observed in 24 Iowa schools supplied one half of the thiamine allowance while 14 provided one half of the ascorbic acid allowance.

None of the 24 lunches prepared in the Iowa schools supplied one third of the daily allowances for all nine nutrients when the adequacy was determined on the basis of the allowances for children ten to 12 years old. Some nutrients, however, were supplied in amounts only slightly less than the standard. In three lunches only the calories were deficient, in two only vitamin A, in one niacin and in another ascorbic acid. There were inadequate amounts of calories, protein, calcium and iron in the five lunches where six or more nutrients were deficient.

According to the literature the nutritional adequacy of lunches prepared, served or consumed in different schools varied extensively. In the schools participating in the National School Lunch Program, menus were planned on the basis of the Type A menu pattern which suggested types and amounts of certain foods necessary for an adequate lunch. The ex-

tent to which these lunches were nutritionally adequate for the group served depended in part upon the kinds and quantities of ingredients used in preparing the menu items and the size of the standard portions served.

## Nutritive Value of Standard Portion of Lunches Prepared in Relation to the Cost, Preparation Time and Amount Consumed

A major problem in school lunch food service is the planning and preparation of nutritionally adequate, attractive and palatable meals acceptable to children when income, facilities, equipment and the abilities and skills of the employees are limited.

James (46) concluded that the most nutritionally adequate lunches served in a rural Iowa school were usually the most expensive. Some personnel in the lunch programs observed for the present study expressed the opinion that the foods suggested as necessary for an adequate lunch were too expensive, required too much time for preparation or were not well accepted by the students. A few recognized that optimum use of the commodities donated by the United States Department of Agriculture made it possible to provide more nutritious lunches at a limited cost.

The per meal food cost, value of commodities, total

monetary value, preparation time and the percentage of food consumed are included in Table 16. The data are tabulated according to the increasing number of nutrients deficient in the lunches prepared. To determine the cost of a standard portion of each food item prepared in 24 schools, the cost of the food purchased and used in the preparation of the item was divided by the number of standard portions of that item prepared. These portion costs of the menu items were totaled to determine the food cost per lunch prepared. The monetary value of the commodities used per lunch was calculated using the same method. The total monetary value of the meal was the cost of the food purchased plus the value of the commodities. To find the per portion preparation time, the labor time expended for the preparation, exclusive of other labor time, was divided by the number of standard portions prepared. The per portion preparation times for the items in a lunch were totaled to find the preparation time per lunch. (See Appendix D, Table 20.)

For the standard portions prepared in 22 schools, the per meal value of commodities ranged from 1.3 to 8 cents and averaged 3.6 cents. It was interesting to note that for the school using the highest value of commodities, the cost of the food purchased was approximately the same as that for the food purchased in the school where the lowest value of commodities was used. In the former the protein

Table 16. Per Meal Food Cost, Value of U.S.D.A. Commodities, Preparation Time and Per Cent of Food Consumed in Relation to the Nutrients Supplied by Standard Portions in 24 Iowa School Lunches on the Day Observed

| School | Per Meal Food Cost | Value of U.S.D.A. Com. | Total Monetary Value of Lunch | Per Meal Preparation Time Min. | Food Consumed % | Nutrients Deficient No. |
|---|---|---|---|---|---|---|
| 111 | $ .209 | $ .031 | $ .240 | 3.17 | 95.18 | 1[e] |
| 112 | .162 | .080 | .242 | 3.25 | 97.61 | 1[h] |
| 211 | .182 | .030 | .212 | 3.48 | 98.73 | 1[e] |
| 212 | .268 | - | .268 | 2.73 | 99.50 | 1[i] |
| 231 | .168 | .020 | .188 | 3.00 | 93.35 | 1[a] |
| 232 | .100 | .041 | .141 | 3.00 | 99.06 | 1[a] |
| 235 | .127 | .043 | .170 | 2.36 | 93.74 | 1[a] |
| 233 | .203 | .034 | .237 | 2.67 | 98.87 | 2[a,d] |
| 234 | .106 | .062 | .168 | 2.15 | 95.09 | 2[a,h] |
| 123 | .182 | .036 | .218 | 2.07 | 95.07 | 3[a,c,f] |
| 221 | .161 | .048 | .209 | 1.62 | 90.91 | 3[a,c,e] |
| 238 | .133 | .030 | .163 | 1.76 | 97.52 | 3[a,d,e] |
| 2311 | .163 | .046 | .209 | 1.60 | 94.60 | 3[a,d,f] |
| 213 | .107 | .018 | .125 | 1.44 | 99.31 | 4[a,e,g,h] |
| 223 | .136 | .052 | .188 | 1.29 | 92.97 | 4[a,d,f,g] |
| 2312 | .175 | .013 | .188 | 1.97 | 86.36 | 4[a,c,d,e] |
| 122 | .103 | .025 | .128 | 1.08 | 92.35 | 5[a,b,d,f,h] |
| 237 | .145 | .040 | .185 | 2.86 | 95.84 | 5[a,d,e,f,h] |
| 2313 | .124 | .058 | .182 | 2.46 | 91.94 | 5[a,b,d,f,h] |
| 121 | .155 | .009 | .164 | 2.18 | 98.60 | 6[a,b,c,d,f,i] |
| 2310 | .157 | .021 | .178 | 2.08 | 94.10 | 6[a,b,c,d,f,g] |
| 222 | .193 | .013 | .206 | 2.17 | 93.22 | 7[a,b,c,d,g,h,i] |
| 236 | .088 | .041 | .129 | 1.98 | 93.38 | 7[a,b,c,d,f,h,i] |
| 113 | .130 | - | .130 | .45 | 99.32 | 9 |
| Average | .153 | .036 | .186 | 2.20 | 94.92 | |

[a]Calories [b]Protein [c]Calcium [d]Iron [e]Vitamin A [f]Thiamine [g]Riboflavin [h]Niacin [i]Ascorbic Acid

was only slightly lower than for the lunch with the highest protein and only one nutrient was deficient. In the school where the lowest value of commodities was used, the protein provided was the lowest for all of the lunches and six nutrients were inadequate.

Some relationship between the total monetary value and the nutritive value of the lunches was apparent; of the seven lunches which were deficient in only one nutrient, the monetary value of five exceeded the average for all of the lunches, 18.6 cents. Of the seven lunches with the greatest number of deficiencies, the monetary value of only one exceeded the average.

There was evidence of some relationship between the labor time used for preparing the lunch and the nutritive value. Of the seven lunches which were deficient in only one nutrient, six required the highest amount of preparation time. The lunch which was deficient in all nutrients required the lowest preparation time and was the only one for which less than one minute of preparation time per lunch was used. When a lunch was more adequate, more menu items and items which required more time for preparation, such as vegetables, salads and main dish items were included. (See Appendix D, Table 20.)

Four of the seven schools where the lunch was deficient in only one nutrient were provided with some power equipment

and other institution type equipment such as deck ovens and steamers. (See Table 11.) One of the other three kitchens was equipped with a deck oven and a range, two had institution type equipment. The lunch having the most deficiencies was prepared in a kitchen which was relatively well equipped.

Some of the more specific relationships for the individual schools between per meal total monetary value, per meal preparation time, percentage of food consumed and nutrients supplied are shown in Figures 4 and 5. These figures illustrate the percentage of the recommended daily dietary allowances which were provided by eight lunches. These lunches represent the extremes in per meal monetary value, preparation time and value of commodities used and the percentage of calories or protein provided and food consumed. The amount of calories or protein afforded by these lunches was emphasized because it is generally recognized that some school lunches provide inadequate amounts for older children.

In general more nutrients were provided in adequate amounts in the lunches where either the per meal monetary value, preparation time and value of commodities used or the amount of calories or protein were the highest for all of the lunches served. Of the four lunches illustrated in Figure 4, three supplied inadequate amounts of calories. The lunch in School 212 which included the highest amount

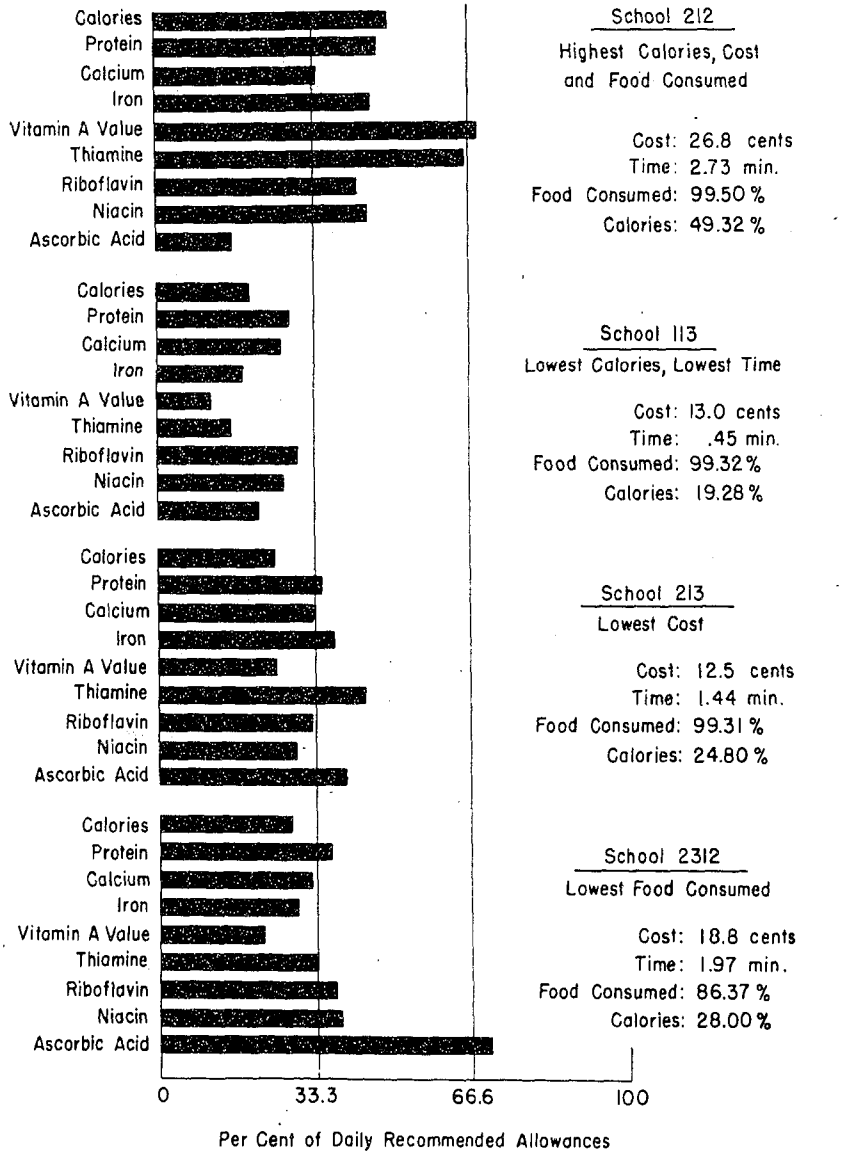


Fig. 4 Per Meal Food Cost and Preparation Time and Per Cent of Food Consumed in Relation to the Calories and other Nutrients Supplied by Four School Lunches

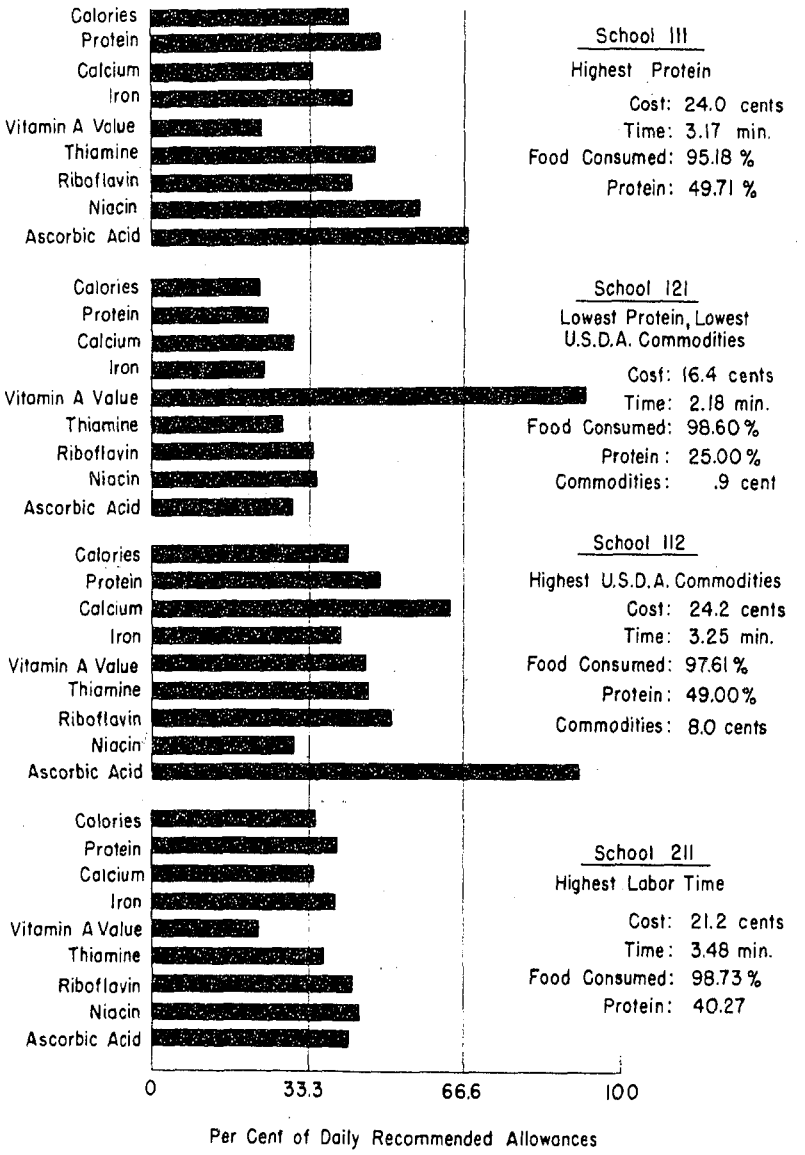


Fig. 5 Per Meal Food Cost and Preparation Time and Per Cent of Food Consumed in Relation to the Protein and other Nutrients Supplied by Four School Lunches

of calories and cost the most, also supplied 47.43 per cent of the protein allowance and the greatest amount was consumed. The preparation time for this lunch was relatively high. The lunch was adequate in all nutrients with the exception of ascorbic acid. The lunch served in School 113 provided the lowest amount of calories, was also deficient in all nutrients, had a low food cost and the lowest preparation time, but there was a high percentage of food consumed.

The two lunches which illustrated extremes in the amount of calories provided were the only two self-selected lunches of the 24 analyzed. Seventy-five of the 471 students eating in the cafeteria in School 212 selected the lunch analyzed in the present study and paid 43 cents. Eighty-six of 481 students in School 113 selected a plate lunch combination and paid 30 cents. The selling prices of both of these combination lunches were higher than the average price charged for the Type A lunches served in other schools. Dreisbach and Handy (26) found a wide range from school to school in the food and labor costs for Type A and self-selected lunches.

The other two lunches illustrated in Figure 4 provided less than one third of the caloric allowance and slightly more than one third of the daily allowance for protein. The per meal preparation time was relatively low; the cost for one was low and for the other relatively high.

Of the four lunches illustrated in Figure 5, three pro-

vided more than one third of the daily nutritional allowance for protein for children ten to 12 years old. The lunch containing the highest amount of protein provided the second highest percentage of calories. When the greatest amount of commodities were used, the protein was the second highest amount supplied by a lunch and the calories the third highest. In these two schools where preparation time was relatively high and in the school where the preparation time was highest, both the protein and calories were adequate in the lunch prepared. The lunch, which provided the lowest protein and in which the lowest value of commodities was used, supplied less than one fourth of the allowance for calories.

Other findings of the present research, as discussed previously, have indicated variation among the high schools in the various management aspects studied. It was interesting to note that of the eight lunches representing the extremes, as shown in Figures 4 and 5, six were prepared in high schools.

The data presented in Table 16 and Figures 4 and 5 indicated that on the day observed in the schools studied, the menu items included in the more nutritionally adequate lunches were relatively more expensive and usually required more preparation time than for the menu items in the lunches which were nutritionally less adequate. The kind of equipment available, such as a mixer, deck oven or steamer, might

have been a factor influencing the variety of menu items possible to prepare in a school. As previously discussed, factors other than cost, labor time and the nutrients provided apparently influenced the amount of food consumed in the schools observed.

## RECOMMENDATIONS

The findings of the present study indicate some specific needs for increasing the efficiency of the management and operation of the lunch programs studied. There was evidence that lunch personnel in the smaller schools, particularly those with 12 grades and where cook-managers were responsible for the supervision of the lunch program, need some assistance in organizing work, planning schedules and controlling costs. In those schools few of the employees had previous training or experience in food service, equipment was usually inadequate and the lunch program was operated with limited funds.

Since there was an apparent direct relationship between preparation time, cost of food and the nutritive value of the lunches prepared, guidance in certain phases of management and operation might well result in the planning and preparation of more nutritionally adequate lunches. The lunch personnel in the smaller schools need training and experience not only in planning nutritionally adequate lunches, but in planning such lunches with consideration for the efficient use of labor time, for the utilization of the foods which supply the most nutrients in relation to their cost and for the optimum use of the commodities donated to

the lunch program. On the basis of the findings of the present research, it is recommended that training conferences and short courses for school lunch personnel should emphasize these aspects of management and operation.

Equipment was inadequate in most of the smaller school lunch programs, presumably because funds were not provided for purchasing the institution type of equipment necessary or because some workers were not aware of the labor saving devices available. School administrators and lunch personnel should take more advantage of the assistance and suggestions provided by the state school lunch personnel for planning school lunch kitchens and acquiring or constructing equipment.

Recommendations are made for further analyses of some of the data presented and for more specific and comprehensive studies. To obtain information which would be more representative of school lunch programs in the state, the size of the sample for certain measures should be estimated on the basis of the statistical data provided by this basic research study.

There was evidence that certain management factors varied among the groups of schools. This and other investigations have shown that the number served affected some aspects of management. It is recommended that when data

regarding school lunch management and operation are analyzed, the schools should be classified not only according to the three groups, the high schools, elementary schools and schools with 12 grades but also according to the number of lunches served.

Since the average percentage of enrolled pupils participating in the lunch programs in the Iowa schools studied was lower than that reported by other investigators, a more extensive study of the participation is recommended. To determine the more specific factors influencing the percentage of enrolled pupils who eat in the lunchroom, data regarding where all students eat regularly and why should be obtained. Other factors pertinent to this aspect of the school lunch program need to be investigated, such as the effect of the selling price, the quality and quantity of food served and the extent to which the school and community cooperate with the lunch program.

A comparison of labor time and cost in schools where only regular workers are employed and where student workers assist during the hours of peak load of work is recommended for providing information on which to base suggestions for more efficient organization of work and control of labor costs.

The importance of adequate dining room space and facilities for providing opportunities for guidance in social

behavior and citizenship is recognized. In several of the schools dining room space and space adapted for use as the dining room was inadequate. A study of the amount of linear table space as well as of dining room area provided per seat in the dining room is suggested as a method of determining the adequacy of the dining room facilities and the needs for improvement when compared with accepted standards.

Although average school lunch expenditures in the Iowa schools studied coincided in general with those reported by other investigators, there was wide variation among schools in the amount spent for food. When obtaining these data, it was apparent that school administrators and lunchroom managers were concerned about the increasing food and labor costs and desired information regarding the average expenses for other lunch programs. Because of this concern and interest and since costs have increased considerably since the data for the present research were collected, a more extensive study of school lunch expenditures for a year, particularly in the schools with 12 grades, is recommended to determine operating costs representative for the schools in the state.

Since the analyses of income and expenditures indicated that in some schools the expenses for banquets and other special functions exceeded the income, it is recommended that financial policies should be established for the school

lunch program regarding the provision of services for special functions.

The monetary value of the commodities donated by the United States Department of Agriculture which a school uses during a year should be determined to give a more adequate picture of the total cost of the food used. In addition to the monetary value of the commodities used, the nutritive value should be calculated to demonstrate their financial and nutritional contributions to the school lunch program.

Since evidence was provided by the present study and other school lunch surveys that salads, vegetables and main dish items were some of the foods returned most often and in the greatest amounts, further studies are suggested to determine the amount and kind of food returned, the number of food items returned by each student as well as specific reasons why the students did not eat the food. The amount of each food item returned per person returning that item should provide some clues regarding factors influencing the acceptance of food items in the individual schools. A study of the amount of a food item returned in relation to the average size of the portion served might indicate other pertinent factors.

That elementary pupils usually return more food than others has been indicated by several investigators. The results of further studies of the kind and amount of food

returned in the schools with 12 grades could be compared to the findings of other research if the data regarding the food returned were recorded separately for the elementary and high school students.

A more specific classification of menu items than was used in the present study is recommended to ascertain the acceptability of foods by students and provide information for planning school lunch menus. The following classification is suggested: meats, fish and poultry; meat substitutes; cooked vegetables; salads, including raw vegetables; sandwiches and breads; desserts; fruits; fruit juices and milk.

Since the standard portion of the school lunches prepared did not meet the dietary allowances for several of the nutrients necessary for the older children, portions should be varied to meet the nutritional needs of the children served.

The nutritive values of the standard portion of food prepared for a school lunch can indicate that the lunch planned was adequate or near adequate. In view of the kinds and amounts of food returned by pupils in the Iowa schools investigated, it is recommended that the nutritive value of the average portions of the foods served as well as consumed per student should be calculated and compared to the value of the standard portions prepared. The data necessary for such a study are included in Appendix D.

The findings of the present research as well as of the additional studies suggested should be made available to those concerned with the management and operation of school lunch programs in the state in order to compare them with similar data for individual programs and to ascertain the specific problems involved in achieving the standards suggested for school lunch programs.

# PART II

## EDUCATIONAL CRITERIA FOR SCHOOL LUNCH PROGRAMS

## STATEMENT OF PROBLEM

Those who plan educational programs in elementary and secondary schools should be concerned with the social and physical development of children. Educators are coming more and more to believe that educational objectives are more successfully achieved if the curriculum is correlated with the other experiences and needs of the child. A school lunch program presents a variety of opportunities for valuable learning experiences. The lunchroom has been described as a natural situation for learning by doing because it gives a lifelike quality to the learning experience, offering occasions for developing democratic attitudes and patterns of behavior as well as improving physical well-being.

The steady increase in the number of school lunch programs in the United States is evidence that school administrators and communities recognize to some extent the value of such programs. Nutritionists are aware of the opportunities they offer for improving food habits and health. Until recently few administrators, nutritionists and others closely associated with school lunch programs acknowledged the broad educational potentialities of such programs. Studebaker emphasized this in 1944 (116, p. V):

> In many schools the educational aspects of the lunch have received scant attention, and the lunch has not been related in a vital way to the educational program of the school. There are, however, notable exceptions. In some schools the lunchroom is a laboratory in which pupils learn the best ways of solving some of their basic problems in healthful living and citizenship. It is only an economical use of school resources to see that the educational potentialities of the school lunch are realized in every school.

In those schools where little consideration has been given to the educational possibilities of the school lunch, the problems of planning and providing for the physical facilities and attaining management and operational standards may have prevented some administrators from giving attention to the development of an integrated school lunch program. There are others who are not aware of many of the educational potentialities of such a lunch program. Although it is feasible and desirable to develop the educational program and the management procedures simultaneously, there is a tendency to focus attention on the latter, to the almost complete exclusion of the educational aspects.

## Review of Literature

The literature indicates an increasing interest in extending the educational scope of the school lunch program. Several authors have suggested that, if the lunch program is to be educationally effective, it should be an integral part of the total school program (2) (30) (106) (65) (7). Al-

though emphasis on the educational aspects of the school lunch program has increased since 1940, its place in the school program was anticipated as early as 1920 by Smedley (92, p. 8):

> It is safe to predict, however, that with the general tendency of the functions of the school to broaden and extend, the school lunch will become an integral part of the educational system of all large cities, if not of small cities and of many rural communities. One can picture the day not too far distant when each school building will include in its plans the equipment for kitchen and lunch rooms, and the school lunch will be an important and assured adjunct to school work correlated with the educational scheme in many ways as yet undeveloped.

Recently several authors have indicated that it is time to evaluate lunch programs to determine the extent to which they are an integral part of the school's educational program. While reviewing the literature on the management and educational aspects of the school lunch, the writer found that in some surveys an endeavor had been made to evaluate the educational effectiveness of lunch programs. In other studies methods for appraising the effectiveness of lunch programs have been developed.

In 1939 Lund (61) determined whether the school lunch program could influence food selection, social customs and civic responsibilities in one junior high school. Members of the student council, teachers and students in the home economics department helped the school lunch manager conduct

an educational program which was correlated with school lunch activities. Data concerning the food selection of the students, their social behavior and citizenship were collected and analyzed during periods preceding and following the educational program. The findings seemed to indicate that (61, p. 26):

> . . . the educational program carried on in relation to the cafeteria had contributed to the ability to recognize good values in selecting food as a means of securing and maintaining health, to function as a member of a social group in a social situation, and to accept greater responsibility for the improvement of community living. It is recognized, however, that some of the improvements may be in part due to other aspects of the educational program of the school.

Opportunities provided for furthering the educational effectiveness of the school cafeterias in two schools in one city were studied by Junkin (49). There was evidence that pupils were not choosing food which met their nutritional needs and that pupils needed experience in the use of generally accepted social customs. Junkin (49) believed that the school cafeteria could be effective in improving the pupils' dietary habits, their social behavior and citizenship. She suggested that more cooperation between the cafeteria and other school departments and organizations would be advantageous in the promotion of the educational program of the school as well as of the cafeteria.

Through the use of questionnaires, Rainey (85) attempted

to evaluate the effectiveness of lunch programs in selected Arkansas schools in order to make recommendations for the supervision of the educational aspects of the school lunch program. A few characteristics of a lunch program which is an integral part of the total school program were defined to a limited extent.

Various guides and standards have been developed for appraising school lunch programs. Riddle (88) proposed a set of standards in the form of policies to be used as a basis for a score card with which a school could judge the adequacy of its lunch program. Seventy-four persons active in school lunch, nutrition and public health work reviewed the proposed policies. There was unanimous agreement among the members of this group that the school lunch should be an integral part of the total school program but the practices of a lunch program which is an integral part of a school's educational program were not described.

Certain phases of school lunch programs in New York were analyzed by Arnold (3). She reported that 216 out of 294 administrators answering a questionnaire indicated that the lunch programs in their schools were an integral part of the educational program. However, the questionnaire provided no criteria on which to base such judgment.

An appraisal form for school lunch programs, developed in 1944 by the United States Cooperating Committee on School

Lunches (115), was revised in 1948. In it were included guides for determining school interest and participation in the school lunch program as a basis for judging the educational effectiveness of the lunch program. The interest of the school in the lunch program and its support by the school are evaluated on the basis of the amount of financial assistance which the school board provides for the operation of the school lunch and the extent to which the school administrator and teachers integrate the lunch program with the total school program and participate in planning, supervising and operating the school lunch. The amount of participation in the lunch program on the part of the pupils is used also to indicate school interest. A few examples were given as guides for determining how the lunch program and the school's educational program are correlated.

Tinsley (105) developed a set of instruments for appraising the effectiveness of school lunch programs. The educational value of the lunch program is to be judged on the basis of how and by whom it is planned and evaluated, the kind and extent of participation of teachers, pupils and community members, and the development of good food, health and social habits by the pupils.

In most of the studies reviewed, the interpretation of what makes a school lunch an integral part of the total school program was made by the group or person answering

the questionnaire. In only a few instances were there any criteria by which to judge the lunch program on that basis. Methods of defining the characteristics of an educationally effective lunch program varied extensively.

There is an apparent need for a set of criteria with which to determine to what extent a school lunch program is an integral part of the school program since there is indication of interest in the educational opportunities provided by the school lunch. An evaluation of a lunch program in relation to sound criteria can be one step in increasing its educational effectiveness. Those who are responsible for and who participate in such an evaluation might become more aware of its educational possibilities if they could judge the program on the basis of such criteria.

## Purpose and Basic Assumptions

The purpose of this part of the study was to develop a set of criteria which can be used to determine to what extent a school lunch program is an integral part of the total school program. Two assumptions are basic for this aspect of the study: first, a school lunch program should be based on educational objectives and second, the educational potentialities of the school lunch program can be more fully realized if the program is an integral part of the total school program.

## EDUCATIONAL OBJECTIVES FOR SCHOOL LUNCH PROGRAMS

A perusal of objectives proposed by persons writing about school lunches indicates that there are two types of goals which the school lunch program might be expected to achieve. Objectives have been stated in terms of the social and physical growth of the pupils. Lunchroom managers and nutritionists tend to stress the physical growth of the pupils when proposing school lunch objectives. Other educators recognize the contribution which the school lunch can make not only to the health but also to the social development of pupils.

Rather than state the specific educational objectives of a school lunch as such, a more positive approach to making the lunch program an integral part of the total educational program of the school is to consider the contribution which such a program can make toward achieving the educational objectives of the entire school program.

Of the general educational objectives which have been proposed, those stated by the Educational Policies Commission seemed to be most comprehensive (28, p. 189):

> . . . four aspects of educational purpose have been identified. These aspects center around the person himself, his relationships to others in home and community, the creation and use of material wealth,

and socio-civic activities. The first area calls for a description of the educated person; the second, for a description of the educated member of the family and community group; the third, of the educated producer or consumer; the fourth, of the educated citizen. The four great groups of objectives thus defined are:

1. The Objectives of Self-Realization
2. The Objectives of Human Relationships
3. The Objectives of Economic Efficiency
4. The Objectives of Civic Responsibility.

The Educational Policies Commission (28) described the behavior and attitudes of a person who had achieved each of these objectives. Those believed pertinent to the school lunch program are listed.

1. The objectives of self-realization. The educated person has an appetite for learning, solves his problems of accounting and calculating, is skilled in listening and observing, understands the basic facts concerning health and disease, protects his health and that of his dependents, works to improve the health of the community, appreciates beauty and gives responsible direction to his own life.
2. The objectives of human relationships. The educated person puts human relationships first, enjoys a rich, sincere and varied social life, can work and play with others and observes the amenities of social behavior.
3. The objectives of economic efficiency. The educated producer knows the satisfaction of good workman-

ship, maintains and improves his efficiency, appreciates the social value of his work and plans the economics of his own life. The educated consumer develops standards for guiding his expenditures, is an informed and skillful buyer and takes appropriate measure to safeguard his interests.

4. The objectives of civic responsibility. The educated citizen is sensitive to the disparities of human circumstance, acts to correct unsatisfactory conditions, seeks to understand social structures and social processes, respects honest differences of opinion, has a regard for the nation's resources, is a cooperating member of the world community, respects the law, accepts his civic duties and acts upon an unswerving loyalty to democratic ideals.

# EDUCATIONAL CRITERIA FOR SCHOOL LUNCH PROGRAMS

## Beliefs Basic to the Development of the Criteria

Beliefs which are basic should be clarified before the six proposed criteria are presented. First, a school should have educational objectives which have as their inclusive purpose the greatest possible social and physical development of each child under its jurisdiction. Second, the ideal situation for the development of an educationally effective school lunch program is a school which is administered democratically. This type of administration as defined by Reeves is accepted in this study (86, p. 160):

> . . . the optimum arrangement whereby all persons affected are adequately represented in policy-making, whereby proper degrees of deference are given to the wishes of the different classes of patrons and beneficiaries of the service, and whereby appropriate reliance is placed upon the special skills of different grades of professional and technical employees. Underlying the whole are two basic principles: (1) universal respect for individual human worth and dignity, regardless of rank or class or race or sex or creed; and (2) ever increasing emphasis upon ways and means of co-operation for the common good, with equal and concurrent stress upon the development of individual rights and personal potentialities.

The third belief basic to the development of the proposed criteria is that all persons concerned with the educational

program of the school need to participate to some extent in the lunch program if it is to be an integral part of the school's educational program. The United States Cooperating Committee on School Lunches emphasized the importance of community wide participation in the development of an educationally effective program (118, p. 6):

> The total school lunch program is the concern not only of superintendent and principal, but of teachers, pupils, parents, and janitors as well. The degree to which all of these persons have a part in planning, carrying out, and judging the school lunch program will determine whether or not it is successful.

Administrators, teachers, pupils and other school personnel and community members can and should assist in achieving the educational objectives of the school through participation in the development and maintenance of a school lunch program by proposing and developing policies, interpreting the policies and objectives to the school and the community, correlating the lunch program with the school curriculum and evaluating the lunch program.

## Developing the Criteria

On the basis of personal experience and observation, a review of the literature and of beliefs and opinions expressed by persons concerned with the educational effectiveness and the objectives of school lunch programs, a concept was developed of the basic characteristics which are es-

sential for a school lunch that is an integral part of the school program.

The following general criteria were proposed as a basis for determining to what extent a school lunch is an integral part of the total school program.

1. There are sound policies for the administration of the school lunch program.
2. The school administrator assumes responsibility for the administration of the school lunch program.
3. Teachers assume and share responsibilities for promoting the educational effectiveness of the school lunch program.
4. Pupils participate in educational activities related to the school lunch program.
5. The professionally trained manager and the school lunch personnel contribute to the educational effectiveness of the school lunch program.
6. Community members participate in the school lunch program.

## The Criteria

### There are sound policies for the administration of the school lunch program

Administration, as it is used here, refers to the proc-

esses involved in the management and operation of an enterprise. If its ultimate objectives are to be attained, such an enterprise should be guided by basic policies which provide purpose and direction for its operation and management. Policy is defined as a course of action adopted and followed by a government, institution, body or individual. Stratemeyer and others emphasized the value of basic policies or principles in school administration (99, p. 397):

> . . . Sound administration works in terms of principles understood by all those affected. Only then will action be consistent, will decisions be made on sound bases, will teachers and learners find in the administration a positive and constructive help in meeting their problems. There will be none of the insecurity that comes when decisions are countermanded, when decisions are at variance, and when they are not made with reference to the whole of which they are a part.

Such basic policies can serve to orient administrators, teachers, professionally trained managers, other school personnel and community members and give them a better understanding of the purposes of the various aspects of the school lunch program.

The importance of clearly defined policies as a guide for the administration of any phase of the school program is recognized. However, if the administration is to be effective in attaining the objectives of the school, the policies must be sound. A sound policy is interpreted as a course of action which has been developed and accepted

by those persons involved in and affected by the management and operation of the school lunch and which makes a definite contribution to the achievement of the educational objectives of the school.

The school administrator assumes responsibility for the administration of the school lunch program

The school administrator, as the term is used here, refers to the person who administers the school unit for which a lunchroom provides meals. Such an administrator would direct the program according to policies approved by any higher administrative officials and the school board. Continuity and consistency in the functioning of any school activity demand that the school administrator implement and maintain such policies. McGrath (63) considered administration an indispensable element in an effective school program, just as it is in every type of human organization of any size or complexity. The belief was expressed by Tyler (111) that administration in the school involves the coordination of the various educational activities and services of the school as well as the provision of the resources, the personnel and the time essential for conducting the educational activities.

There is some agreement among those closely associated with school lunch programs that the school administrator

should be responsible for the effective management and operation of the lunchroom as well as for the coordination of the lunch program with other educational activities and services of the school. Some Florida educators, acknowledging the importance of the role of the school administrator in the lunch program, stated that the responsibility for the administration, operation and supervision of the school lunch program should be vested in the educational authorities who administer all other phases of the school program (33). A review of the literature indicates agreement by school lunch supervisors that this does not imply that the administration should become directly involved in the aspects of management and operation of the lunch program which require special techniques and skills. The administrator needs to delegate the responsibilities for the various phases of the lunch program to others in the school and the community in terms of accepted policies.

State school lunch directors and supervisors have emphasized the importance of the school administrator's special contribution in making the school lunch program educationally effective. They recognized that the educational possibilities of the lunch program will vary with the educational philosophy of the administrator. Prentice (84) has said that success or failure of the school lunch program rests on the school administrator.

If a school lunch program is to be effective educationally, however, the administrator should provide opportunities for teachers, pupils, professionally trained managers, lunch personnel and community members to participate in developing school lunch policies. He needs to promote the continued functioning of policy formulating groups and administer the lunch program according to the policies proposed and approved by the groups concerned.

The administrator should promote also the interpretation of the objectives as well as the policies of the lunch program to teachers, pupils, other school personnel and community members. The educational objectives of the school might be attained more readily if the administrator stimulates the interest of these groups in correlating the lunch program with extra-class and class activities.

In order to know the existing conditions of the lunch program, become more aware of needs for its improvement and to help clarify the objectives, the administrator should propose and direct an evaluation program in which the school and community members could participate.

Teachers assume and share responsibilities for promoting the educational effectiveness of the school lunch program

Democratic administration provides opportunities for teachers to share in planning the educational program of a

school. Teachers are in a position to observe pupils, recognize their needs, associate these needs with stages of development and utilize learning experiences provided by the various school services as means of satisfying the needs of the pupils.

There is general acceptance of the belief that all activities and experiences of pupils should be related; that class and extra-class experiences should be planned as a unit. Teachers need to consider the school lunch as one of the services to be integrated with other aspects of the school program.

Teachers can contribute to the effectiveness of the school lunch by helping to develop sound policies for the administration of the program. They can give constructive criticism and suggestions for such policies in terms of student needs. Educators concerned with the educational effectiveness of the lunch program believed this to be important. This belief is reflected in a discussion of the school lunch program in an Extension Service Bulletin published by the Texas State College for Women. The authors, members of the Department of Home Economics, stated that (103, p. 11):

> The faculty as a whole should be encouraged to offer constructive suggestions and to assume responsibility for success of the undertaking. Where teachers show concern . . . the project has far greater chance to succeed than where some one person is held accountable for the solution of every problem.

Teachers can promote the educational effectiveness of the school lunch program by putting certain of the accepted policies into action. This can be accomplished to some extent by their supervision of pupils in school lunch experiences. Bates (12) included such supervision as one of the aspects which is necessary for an effective lunch program. He believed that supervision of students during the lunch period by teachers is an indispensable aid to students in developing desirable behavior patterns.

Teachers should assist the administrator in interpreting the school lunch program and its policies as another means of making the lunch program educational. The contacts which teachers have with pupils and parents provide opportunities for them to explain the policies in terms of the needs of the pupils as well as the needs of the community in general.

Utilization of the many opportunities for learning provided by correlating class activities with school lunch experiences is another way in which teachers can increase the educational effectiveness of the lunch program. A group of Florida school lunch supervisors expressed the belief that guiding principles for the school lunch program in the state should be consistent with the principles developed for the entire school program by the Florida State Department of Education. Those pertinent to teachers are (33,pp. 8-9):

5. Teachers should utilize the school activities as a means of giving children direct experiences in the processes of democratic cooperative living.

6. Since the individual and the environment are dynamic, the school should utilize problem-situations in such a way as to promote ever increasing ability of pupils to think at the level of their maturation and intelligence.

. . . . . .

9. In planning experiences with pupils, the teacher has a responsibility for stimulating children to judge the importance of their undertaking in terms of their own need and in terms of group needs, that is society's needs.

10. The framework of the curriculum should be built around needs of pupils which arise in their interaction with the culture. Experiences with the immediate natural and man-made environment should be the point of departure and should be expanded in keeping with the growing abilities and interest of the pupils.

Another contribution which teachers can make to the educational effectiveness of the lunch program is the supervision of those aspects of the school lunch for which they have special training and experience. In some schools teachers of home economics, commercial subjects, art, agriculture and industrial arts have used their special training to help in planning and carrying out projects related to the school lunch program. This type of participation by teachers can be a means of strengthening the curriculum as well as giving the school lunch program the advantages provided by the special abilities and skills of those teachers involved.

Teachers also need to help evaluate the educational

effectiveness of the lunch program. The opportunities which they have for observing pupils in a variety of situations at school can provide evidence of changes in pupils or need for changes.

Pupils participate in educational experiences related to the school lunch program

Participation by pupils in school activities is fundamental to a democratic way of life. McGrath believed that such participation should begin at an early age (63, p. 31):

> A review of trends in elementary school organization also shows . . . more emphasis on organization involving cooperative pupil enterprises which focus attention on the child's social responsibilities. . . . This emphasis on group participation is of course consistent with American traditions and its general adoption in the schools of the country will strengthen the democratic processes in years to come. For it begins to inculcate at an early age the habit of group consideration and action, of the assumption of personal responsibilities, and the give and take of democratic social life basic to our culture.

The lunch program can provide opportunities for pupils to participate in the educational program of the school. Permitting pupils to accept some responsibility for promoting the effectiveness of the school lunch program is one of the means by which administrators can encourage planning and self-direction by pupils. The extent to which such participation is educational will depend upon the philosophy of those who encourage and supervise the pupils. The object of this participation should be to provide educational ex-

periences rather than to use the pupils merely to obtain a more efficient operation of the lunchroom.

One of the opportunities for pupils to participate in the lunch program is in the development of some school lunch policies. Pupils need to share in this responsibility in order to understand problems involved in the administration of an effective lunch program. Policies have been proposed and developed in a few schools by a student school lunch committee. Policies can be suggested by any pupils, reviewed and directed to the group responsible for adopting policies of the lunch program.

Another way pupils can participate in the lunch program is giving assistance in the application and interpretation of school lunch policies. The acceptance of lunch program policies might be hastened if pupils are encouraged to explain the policies to other pupils and community members in terms of the importance to the pupils and to the lunch program, the school and the community.

Other opportunities for pupils to participate in the lunch program are available through activities involved in the daily operation of the lunchroom such as assisting in guidance of social behavior and citizenship in the lunchroom, improving the appearance and facilities, preparing and serving food and collecting money. These experiences can be educational if the kind and extent of participation are

related to the educational objectives to be achieved. The planning needs to be student-centered and guided effectively.

Pupils can help evaluate the school lunch program. Their indication of the extent to which the lunch program is satisfying the needs which pupils consider important can provide a sound basis for determining the program's educational effectiveness as well as for improving it.

The professionally trained manager and the school lunch personnel contribute to the educational effectiveness of the school lunch program

Democratic administration of a school will provide opportunities for personnel to become aware of the contribution which special members of the staff can make to the educational program of the school. Stratemeyer and others implied this when referring to curriculum planning (99, p. 397):

> Non-teaching members of the staff are an integral part of the designing process under discussion. . . . Much of what is often thought of as the routine of the school is potentially important as an educative experience. More and more those who work in these units must be a part of the planning groups, must understand the educational program and the part they play in it.

Many supervisors of state and county school lunch programs, professionally trained school lunch managers and others closely associated with such programs agree that the

lunch personnel has a contribution to make to the educational planning of the program. They have suggested that this personnel should be encouraged to participate in developing, applying and interpreting school lunch policies, correlating the lunch program with other school activities and evaluating the program. Through cooperation in all aspects of the lunch program, lunchroom personnel can become aware of their role in achieving the school's objectives. A few authors have indicated that such participation should be considered a part of the responsibilities of the school lunch personnel (94) (109) (68).

A professionally trained manager would be expected to be a member of the policy formulating group. If there is no manager, school lunch personnel should be represented on the policy formulating group. They could propose changes in policies or new policies necessitated by conditions in the physical plant or financial status of the lunch program or by the reaction of pupils to existing policies. The personnel needs to assist others in determining the feasibility of such proposed policies before they are adopted.

Applying and interpreting school lunch policies is another contribution which this personnel can make to the effectiveness of the lunch program. They can clarify certain policies through direct contact with pupils when serving the lunch and supervising pupils in educational experiences

provided in the lunchroom.

Another opportunity for the professionally trained manager and the school lunch personnel to assist in developing an educationally effective program is working with teachers and pupils as they plan experiences related to the school lunch. Cooperative planning of activities for pupils should enable the lunchroom personnel to be more aware of the educational objectives of the experiences which they supervise.

Those responsible for the daily operation of the school lunch program are in a position to make an effective contribution to the evaluation of the lunch program. They have many occasions to observe the amounts of food served and consumed, to hear the pupils' appraisal of the kind and amount of food served as well as of other aspects of the lunch program, to observe changes and need for changes in pupils and to know the financial status of the program and the physical adequacy of the lunch facilities.

Community members participate in the school lunch program

Community members should participate in a democratically administered school program. If they work directly with the school as well as through the school board, there can be a better understanding of the desired direction for the pupils' growth. McGrath (63) referred to evidence of in-

creasing community interest if the school and community relationship is one in which the parents and other community members play a significant role in planning the school's program.

Some educators closely associated with school lunch programs recognize the value of assistance from parents and other community members. Flanagan (32) and Amidon and Drenckham (2) believed that the cooperation of community members is essential if the school lunch is to function effectively as a part of the educational program. They implied that parents and other community members should serve in an advisory capacity in planning the lunch program since they are in a position to observe some aspects of the growth of pupils which may not be apparent at school.

There are several opportunities for community members to participate in the school lunch program. They can play an active role in proposing policies which the community believes are desirable. Selected community members might well assist in interpreting the objectives and policies of the lunch program to others in the community. They can be particularly effective in helping to clarify why certain policies are necessary for the lunch program to function effectively and satisfy the needs of special groups of children.

Another opportunity for parents and other community members to participate in the lunch program is through increasing the availability of community resources to the school lunch. This might be done by improving the physical facilities of the lunch program. In some schools parents and other members of the community assist in the preparation and service of the lunch, donate food or equipment or earn money to be used for improving the physical facilities of the lunchroom.

Members of the community should assist in evaluating the extent to which the school lunch program is meeting the needs of the children and the community. Those who observe boys and girls in the home and community can help to detect changes and need for desirable changes in children which might be effected through experiences provided by the lunch program.

## DEVELOPING AND TESTING THE SCHEDULE

Six general criteria have been proposed as a basis for determining to what extent a school lunch is an integral part of the total school program. These were used as a basis for developing a schedule of questions to be used by school personnel and state supervisors for evaluating a lunch program.

In order to define more clearly the characteristics of a lunch program which is planned to be an integral part of the total school program, specific educational practices were accumulated and classified according to the six proposed criteria. Numerous suggestions for ways in which the school lunch program might be used to help the school attain educational objectives are described in the literature. Other ideas for making the school lunch educationally effective were obtained by observation while collecting data for the management aspects of this study. School administrators, school lunch supervisors and managers and teachers also suggested additional means for making the lunch program contribute to aspects of the social and physical development of children.

Using these classified practices which appear in Appendix F, a schedule of questions was developed for obtain-

ing data believed to be necessary for determining to what extent the proposed criteria are fulfilled in a given school. The schedule is divided into six sections. The first section includes questions to be answered by the school administrator, professionally trained managers and others largely responsible for the lunch program. The questions in the second section were planned to determine to what extent teachers were assuming and sharing responsibilities for promoting the educational effectiveness of the lunch program. The third section was developed for obtaining information from pupils who were participating in the lunch program. The fourth section includes questions to be directed to the manager and the school lunch employees for determining their contribution to the educational effectiveness of the lunch program. The questions in the fifth section of the schedule were designed for obtaining from community members, information which would indicate the kind and extent of their participation in the school lunch program.

The sixth section of the schedule is planned to obtain specific information concerning the dining room facilities provided. Using this information the adequacy of the dining room space and facilities can then be evaluated on the basis of acceptable standards (123).

Before attempting to use the schedule experimentally as a basis for evaluating school lunch programs, the pro-

posed criteria and the schedule were reviewed by the Director and Nutritionist of the Iowa School Lunch Program. They accepted the proposed criteria as an adequate basis for determining to what extent a school lunch is an integral part of the total school program. They also believed the educational practices to be practicable and desirable characteristics of school lunch programs. In their judgment the number and type of questions were reasonable and also the schedule, with a few additions, would provide information necessary to determine to what degree the proposed criteria are fulfilled in a given school. After suggested changes were made, an Area Home Economist for the School Lunch Division of the United States Department of Agriculture and a Field Supervisor for the Iowa School Lunch Program reviewed the criteria and the schedule for adequacy and feasibility of administration.

The adequacy of the schedule to supply the information believed to be necessary to evaluate a school lunch program in relation to the proposed criteria was checked further by pre-testing in two schools. The schools were selected because of the possibilities they provided for testing the questions planned for the school administrators, school lunch personnel and some teachers, pupils and community members. Each person interviewed was requested to indicate whether the questions were difficult to answer; whether

there was an excessive number of questions and whether the interview required too much of their time. There were no unfavorable responses and no evidence that the kinds of participation in the lunch program as indicated by the questions seemed impractical or unreasonable. During several of the interviews some of the questions elicited discussion which answered succeeding questions in the schedule. In both schools more information than was necessary to complete the schedule was offered indicating that some additions to the schedule would result in more adequate data. The two administrators indicated that the time required for their interview was not excessive and neither was aware of the number of questions they had answered.

To facilitate recording the data during the interview, each question was placed on a card. In addition to the questions each card included possible answers with space allowed for additional answers and comment. This minimized the amount of writing during the interview.

Pre-testing the schedule gave some indication of the amount of time necessary for obtaining the desired information from a school. This was important for estimating the time required for testing the proposed schedule in each of the ten schools selected later for a more extensive evaluation of the adequacy of the schedule.

As a result of the pre-test changes were made in some questions and in the forms for recording the data in order to provide adequate information and to simplify recording and tabulating the data.

The schedule of questions was then tested in ten schools to determine whether the questions in the schedule would elicit the information believed to be necessary for judging the extent to which a school lunch program is an integral part of the total school program; whether the schedule was applicable to any school and whether the proposed criteria provided a practical basis for this kind of evaluation.

The schools in which the schedule was tested were selected with the advice of the Director of the Iowa School Lunch Program. No attempt was made to sample schools systematically but schools with different sizes of enrollment and kinds of lunch program management were selected. In order to determine whether the schedule could be used to evaluate the lunch program in any type of school, this group included junior and senior high schools, elementary schools and schools with 12 grades in one unit. A school, as the term is used here, refers to the unit for which a school administrator is responsible and which includes lunchroom facilities.

The administrator of each of the ten selected schools was contacted by the Director of the Iowa School Lunch

Program who explained the purpose of the study and requested cooperation in supplying the necessary information through interviews.

The ten schools included three junior and senior high schools, two elementary schools and five schools having 12 grades in one unit. In two of the junior and senior high schools the lunch program also served pupils from the elementary schools in the school system. The enrollment in the ten schools ranged from 65 to 1,150 and the number of pupils served the school lunch varied from 40 to 400.

There was a variety of kinds of school lunch management in the ten schools. In two of them a city school lunch supervisor directed the operation of the program for the entire school system with the assistance of a cook-manager in each school. A volunteer community member was responsible for the operation and management of the lunch program in one small elementary school whereas in another school in a rural area a Parent-Teacher Association committee directed the operation of the school lunch. One lunch program was supervised by a person with home economics training whose major responsibility was the management of the school lunch. In two schools the home economics teacher was in charge of the school lunch program as well as the home economics education program. The management and operation of lunch programs in three schools were each supervised by a woman

who also prepared some of the food and was referred to as a cook-manager.

After the administrators of the ten selected schools expressed their willingness to cooperate in this study, a letter was written or a telephone call was made to each one to indicate that approximately one hour was required for the interview with the administrator. Permission was also requested for opportunities to observe the pupils during the lunch period and to interview teachers, school lunch managers and personnel, pupils and community members who might be participating in some phase of the school lunch program.

The school administrator was the first and last person interviewed in each school. If he could not answer all the questions regarding the administration of the lunch program, the interviewer was directed to the person who could provide the information requested. This person was usually the one responsible for the management of the school lunchroom such as the home economics teacher, the city school lunch supervisor, the school lunch manager, a community member or the cook-manager. Before the interview with the administrator was terminated, assistance was requested for contacting others who were known to be participating in the lunch program.

Arrangements were made to interview elementary teachers

at recess and during the noon period. Other teachers were contacted during study periods or at noon. Pupils were interviewed following lunch and between class periods. Community members who participated in the lunch program were interviewed at a time and place convenient for them. School lunch employees were contacted after lunch was served. Data for determining the adequacy of the dining room facilities of the lunch program were obtained after interviewing the school lunch employees.

In an attempt to insure thoroughness in collecting the data, each individual interviewed was asked to name any other person or persons participating in the school lunch program. Arrangements were then made to interview those persons. In several schools the administrator was not aware of the extent to which some pupils, lunch personnel and teachers were assuming and sharing responsibilities for making the school lunch a part of the educational program.

Before the final interview with the administrator, all questions and answers in each section of the schedule were reviewed. If the data were not complete the administrator assisted in obtaining the necessary information.

The time required in each school to acquire the data necessary for testing the adequacy of the schedule varied from three to six hours depending upon the number of persons

interviewed. The information obtained was recorded by checking one or more of the possible answers which accompanied the questions on each card. An attempt was made to keep the amount of writing during the interview at a minimum. If a question elicited more information than was required by the schedule but which seemed pertinent to an analysis of the data, brief notes were made in the space allotted on the card for additional comment. Immediately after each interview all such notes were elaborated to give a more accurate presentation of the responses which had not been included in the short answer check list. Frequently, this additional information indicated a need for some revision of the schedule.

## FINDINGS

Six criteria have been proposed as a basis for determining to what extent a school lunch program is an integral part of a school's educational program. A schedule of questions was developed for use in evaluating a lunch program in relation to these criteria. This schedule was tried in ten schools to determine its feasibility and adequacy.

The schedule elicited information believed to be necessary for determining to what extent the six proposed criteria were fulfilled in a given school. All information required by the schedule was obtained without difficulty in each of the ten schools.

The need for some changes was indicated as the schedule was tested in the schools. After using the schedule in the first and second schools visited, some questions were restated in order to obtain responses from the administrator which were more descriptive of the situation and to avoid placing the administrator in the position of having to defend the lunch program.. The question "Do you have objectives for the school lunch program?" was asked in the first two schools. In the third and subsequent schools visited the question "Have you thought through and planned objectives

for the lunch program?" seemed to elicit more descriptive information and there was less tendency on the part of the administrator to defend his position if the answer was negative. Rather than to inquire if he had interpreted the objectives to the students, teachers and school lunch personnel, the question was reworded to ask the administrator if he found it helpful to acquaint the students, teachers and school lunch personnel with the objectives of the lunch program. Even though the answer to this question was negative, the administrator usually made further comment indicating some of his attitudes and beliefs concerning the school lunch program.

Following interviews with pupils who were working in the lunchroom in the fourth school visited, one question was reworded. The question "Have you learned anything while working in the lunchroom?" was changed to "What have you learned while working in the lunchroom?" More adequate and descriptive answers were obtained when the latter question was used. The pupils in each of the next two schools visited suggested several possible answers which were added to the form for recording data.

In two of the first six schools visited there was more than one person responsible for the administration, management and operation of the lunch program. In addition to asking who was largely responsible for the program, a

question was added to determine the nature of the responsibilities. The answer indicated the persons to whom some of the questions regarding school lunch policies should be directed.

Revisions were made after testing the schedule in each of the first six schools visited. Whenever there was evidence of need for changes after using the schedule in one school, revisions were made and the revised schedule tried in the subsequent schools visited. There was no apparent need for further changes when the schedule was used in the last four schools.

The schedule was applicable to any one of the ten schools regardless of the size of enrollment, the number of pupils served, the kind of management of the lunch program and the type of school. The revised schedule as shown in Appendix G provided the information believed to be necessary for determining to what extent a school was carrying out educational practices relating to the school lunch program and was useful in evaluating a school in reference to the proposed criteria.

### Evaluating Schools in Relation to the Criteria

The data obtained from each of the schools in which the schedule was tested indicated the educational practices of a school in relation to each of the six criteria which have

been proposed for determining to what extent a school lunch program is an integral part of the school's educational program. For each criterion the practices of two schools are described to illustrate how the information provided by the schedule shows the extent to which that criterion was fulfilled and to show how the schedule can be used to describe a school lunch program. For each of the six criteria the writer selected the one school in which the educational practices showed the greatest and the one in which the practices showed the least fulfillment of the criterion. The schools described are identified by a letter arbitrarily assigned to each school visited.

The general practices believed to be characteristic of a school whose lunch program is educationally effective are itemized for each criterion before the specific practices of each school are described.

There are sound policies for the administration of the school lunch program

Policies believed to be basic and sound for the administration of an educationally effective school lunch program are:

1. The school administrator is responsible for the administration of the lunch program

2. The lunchroom provides possibilities for all pupils to improve dietary habits, social behavior and citizenship
3. Teachers are encouraged to assume and share responsibilities for promoting the educational effectiveness of the program
4. Pupils are encouraged to participate in educational activities related to the school lunch program.
5. The contribution of the professionally trained manager and the educational effectiveness of the lunch program is recognized
6. Community members are encouraged to participate in the school lunch program
7. The school lunch program is interpreted to the community
8. Management and educational aspects of the school lunch program are evaluated periodically.

School I. The principal of this particular school had assumed some responsibilities for the administration of the lunch program although the person in charge of the management and operation of the lunchrooms for the city school system supervised the program. A specific description of the responsibilities involved in administering the school lunch program is included in the subsequent discussion of the second criterion.

The lunchroom afforded to some degree opportunities for pupils to participate in learning experiences to improve dietary habits, social behavior and citizenship. Lunch was available to all pupils regardless of their ability to pay. Those pupils who brought their lunch ate in the lunchroom and were permitted to buy food to supplement their lunch. The thirty minutes scheduled for the lunch period more than met the requirement agreed upon by those planning school lunch programs that at least twenty minutes should be allowed for pupils to eat their lunch. When adequate time is provided for eating lunch, there are more opportunities for improving dietary habits, social behavior and citizenship.

According to the standards of a minimum of 9 square feet per seat proposed by the United States Department of Agriculture (123), this school earlier had provided adequate dining room space and facilities for the 400 pupils who ate there regularly. Originally the dining room allowed 9 square feet of space for each seat but because the number of pupils eating in the lunchroom had increased, forty seats had been added recently. This decreased the dining room space allowance to 7.9 square feet per seat. The teachers reported that there were more problems in social behavior and citizenship since the room became crowded and space between tables narrower. The 18 inches of linear table space for each seat in the lunchroom met minimum require-

ments of 18 to 24 inches recommended for school dining rooms (123).

Teachers had been encouraged to share in promoting the educational effectiveness of the lunch program by being given opportunities to suggest needs for changes in policies to the principal. In addition teachers were asked to supervise pupils during the lunch period for the purpose of helping them improve dietary habits, social behavior and citizenship. Periodically teachers had been asked to evaluate the lunch program in terms of changes in the behavior of pupils.

Some pupils were urged to participate in educational activities related to the school lunch program. Each year the pupils of the sixth grade planned and carried out a school lunch project to help supervise the younger children during the lunch period. All pupils in the sixth grade were given the opportunity to help with this project and most of them participated. The principal believed this policy of encouraging pupils to take part in the lunch program was educationally effective. However, pupils had not been asked to cooperate in developing school lunch policies or assist in an evaluation program.

Evidence that contributions of the manager and the school lunch personnel to the educational effectiveness of the lunch program had been recognized was indicated by the

fact that persons with experience in school food service and an interest in the educational possibilities of the program had been employed to supervise the management and operation of the school lunch. This supervisor proposed policies for the lunch program and participated with the school administrator in making final decisions regarding the policies. Employees of the school lunch program were given opportunities to propose policies at regular meetings of the employees.

The personnel was encouraged to attend city and county conferences planned to give school lunch employees further training in food preparation and service. They had taken advantage of this opportunity and one had also attended a short course conducted at the Iowa State College for school lunch cook-managers. The personnel was expected to give guidance to pupils in improving food habits during the lunch period and to supervise and guide pupils in planning and carrying out work experiences in the lunchroom. They were also asked to cooperate with the teachers in planning the correlation of the lunch program with class activities. The school lunch personnel was expected to evaluate some management aspects of the lunch program in this school. There was evidence that they were taking advantage of all these opportunities to help make the lunch program educational.

Community members were not encouraged to participate

in the school lunch program. The principal indicated the belief that it would be difficult to work with so large a group of parents to provide such participation.

The principal and school lunch supervisor cooperated in interpreting the lunch program to the community. They had explained the lunch program to community members at Parent-Teacher Association meetings in an attempt to increase the parent's interest in its educational possibilities. Also the principal had sent information about the lunch program directly to all parents telling them of the objectives and the cost of the lunch. In addition she sent copies of the school lunch menus to the parents if they desired them.

The management and certain educational aspects of the lunch program in this school had been evaluated periodically to show existing conditions and serve as a guide for planning improvements. The school administrator had asked teachers to help evaluate its educational effectiveness by observing changes in dietary habits, social behavior and citizenship in the lunchroom.

School E. There was evidence that only a few policies had been established for the administration of the lunch program in this small rural elementary school. None of the four teachers was responsible for the administration of this school. A member of the community had volunteered to manage the lunch program under the direction of the board of educa-

tion. She reported that the work required for the management and operation of the school lunch left little time for her to establish policies and administer the program in order to make it more educational. She believed that one of the teachers or a member of the school board would be better qualified to assume such responsibility.

Eating in the lunchroom provided educational opportunities for all pupils to a limited extent in that the lunch was available to all pupils regardless of ability to pay and that those who brought lunches ate them in the dining room with other pupils. Possibilities for improving food habits, social behavior and citizenship were limited because of inadequate dining space. The dining room space allowance per seat was 7.6 square feet in comparison to a suggested minimum of 9 square feet. This did not allow enough space for all pupils to be seated at one time. Since there was only one lunch period scheduled, most of the pupils had to eat their meal in ten minutes. Benches were provided instead of chairs and because space was so limited many of the pupils had less than 12 inches of table space rather than the 18 inches considered to be a minimum for adequacy.

The school lunch manager had made some attempt to induce teachers to help make the school lunch more effective educationally but there was no evidence that they were doing so. Pupils had not been encouraged to participate

in educational activities related to the lunch program.

The contribution of the school lunch personnel to the effectiveness of the lunch program was recognized to the extent that the cook was encouraged to give guidance to pupils in improving dietary habits. Community members other than the manager and the board of education were not participating in the lunch program and the program had not been interpreted to the community. Management and educational aspects of the lunch program had not been evaluated.

The school administrator assumes responsibility for the administration of the school lunch program

A school superintendent or principal assumes responsibility for the administration of the school lunch program when he:

1. Promotes the continued functioning of a policy formulating group
2. Provides opportunities for teachers, pupils, the professionally trained school lunch manager, school lunch personnel and community members to participate in developing school lunch policies
3. Delegates responsibilities for various phases of the lunch program according to the policies proposed and approved by the groups concerned
4. Promotes the interpretation of the objectives and

policies of the school lunch program to teachers, pupils, the school lunch manager, school personnel and community members

5. Stimulates the interest of the teachers, the school lunch manager, and school lunch personnel in correlating the school lunch program with class activities
6. Proposes and directs an evaluation program.

School G. The superintendent of this school was largely responsible for the administration of the lunch program. He had not promoted the organization of a policy formulating group which would function continuously. However, he had permitted some of the school lunch personnel to participate in developing school lunch policies by proposing policies and discussing them with the school lunch manager before final decisions were made regarding such policies. Also teachers were asked to suggest policies at meetings held regularly to plan supervisory duties in relation to the lunch program. The superintendent said that he had used some of these suggestions when he proposed changes in policies to the lunch manager. Pupils and community members had not been encouraged to help develop school lunch policies.

The superintendent had delegated the management and operation of the lunch program to a school lunch manager and teachers who assisted in carrying out established pol-

icies as they supervised pupils during the lunch period.

The administrator had made some attempt to promote the interpretation of the lunch program to teachers, pupils, school lunch personnel and community members. However, he believed that the school lunch manager could explain policies to teachers, pupils and employees more effectively than any other person. The manager held meetings with teachers to clarify policies and objectives at which times they were asked to help explain school lunch objectives and policies to pupils. The teachers cooperated by discussing these periodically during homeroom periods or regular class periods. The manager helped pupils understand some of the school lunch policies while they were waiting in line to be served and while they were eating in the lunchroom. She discussed policies with school lunch employees and other school personnel while supervising their work.

The superintendent reported that the manager had cooperated with him in explaining the school lunch program and its objectives to members of the community. In addition parents had been invited to visit the school lunch to see the new facilities and space provided and eat with and observe the children in the lunchroom. After the new lunchroom was completed, service organizations were encouraged to hold dinner meetings there. The administrator and manager showed these groups the new dining room and kitchen

and described the educational possibilities of such a lunch program.

No attempt had been made to stimulate the interest of teachers and school lunch personnel in coorelating the lunch program with class activities. The superintendent remarked that such correlation could be educationally effective and that perhaps he should promote the idea.

The only kind of evaluation proposed and directed by the superintendent had been a monthly analysis of the financial records of the lunch program. However, he indicated an interest in some kind of evaluation of the nutritional and educational effectiveness of the school lunch program.

School J. The principal in this school had assumed no responsibility for the administration of the lunch program. A school lunch manager supervised the operation of this and all other lunch programs in the city according to policies developed by the board of education, the superintendent of the entire school system and the manager. The principal had been encouraged to coordinate the lunch program with other school services. However, he indicated that efficient management and operation of the lunch program to provide good food with a variety of choices was the objective of the lunch program and was the responsibility of the school lunch manager. No evidence was obtained of any recognition on the part of the school administrator of the educational possibilities of the lunch program.

Teachers assume and share responsibilities for promoting the educational effectiveness of the school lunch program

To promote the educational effectiveness of the school lunch program teachers can:

1. Cooperate in developing policies for the school lunch program
2. Assist in supervision of students during the lunch period, of student planned projects related to the school lunch and of those aspects of the lunch program to which they can contribute their special training and experience
3. Correlate the school lunch program with class activities by guiding students in planning class projects
4. Assist in an evaluation of the school lunch program.

School F. Although the manager of the lunch program, who was also the home economics teacher, had assumed most of the responsibility for promoting the educational effectiveness of the lunch program in this school, some other teachers were assisting her to some extent.

Teachers were not given the opportunity to propose changes in policies to the school administrator directly but the manager reported that she included ideas expressed to her by the teachers when she proposed changes in policies to him.

Some teachers in this school were supervising pupils in various school lunch activities through their daily contact with pupils in the lunchroom. The superintendent reported that teachers of the elementary grades were required to give guidance to pupils during the lunch period to help improve dietary habits, social behavior and citizenship. Several of the teachers interviewed stated that they believed such supervision was an important part of their teaching duties. Some high school teachers had volunteered to supervise pupils during the lunch period.

Teachers in homerooms had helped high school pupils plan projects to improve the appearance of the lunchroom and to interpret school lunch policies to other pupils. During the first semester of the previous year, pupils in each of the homerooms had decorated the dining room for a special occasion or displayed posters to encourage better eating habits. The manager of the lunch program had also promoted these projects.

Other than the home economics teacher who was the school lunch manager, none of the teachers supervised aspects of the lunch program for which they had special training and experience.

There was some evidence that teachers of the elementary grades were correlating the lunch program with class activities. The teacher of the fourth grade used information

from the school lunch records to provide arithmetic problems for her class. She reported that the interest of the pupils was easily maintained because they were solving problems which were a part of their every day experiences. The projects to decorate the lunchroom on special occasions and to make posters to encourage the improvement of eating habits, social behavior and citizenship were correlated usually with class activities in the elementary grades. The superintendent indicated the belief that such correlation was feasible and could be educational but had not been promoted in this school to any great extent. Both the administrator and the school lunch manager reported that teachers of the elementary grades were more cooperative and interested in correlating school lunch experiences with class activities than were the high school teachers. The manager stated that she believed high school teachers would be interested in this phase of the lunch program if she had the time to work with them in planning for such correlation, yet she had not attempted to correlate school lunch experiences with her home economics courses.

Teachers had not assisted in evaluating the lunch program. Both the superintendent and the school lunch manager showed an interest in initiating a more extensive evaluation of the lunch program in which teachers would be encouraged to participate.

School C. The teachers in this school aided to only a limited extent in promoting the educational effectiveness of the lunch program. They were not given an opportunity to propose policies or enter into final decisions regarding policies. The superintendent revealed that he saw little need for asking teachers to supervise any part of the lunch program other than requiring teachers of the elementary grades to eat with their pupils in order to maintain discipline during the lunch period.

Two of the teachers who supervised their pupils during the lunch reported that they were required to do so in an attempt to improve social behavior and citizenship and to encourage the pupils to eat everything served to them.

There was some evidence that one teacher was correlating class activities with school lunch experiences. The teacher of the second grade was attempting to detect changes in dietary habits of pupils in her class during the school year by noting the types of food each pupil accepted or rejected at the beginning of the school year. She had used this information as a basis for planning some class activities to guide the pupils in improving their food habits.

Teachers in this school had no opportunity to assist in an evaluation program since there had been no attempt to evaluate any phase of the school lunch program.

The information obtained from the administrator and

teachers indicated that in this school the educational aspects of the lunch program were incidental to its efficient operation.

Pupils participate in educational activities related to the school lunch program

Pupils need to participate in educational experiences related to the school lunch program. They can:

1. Cooperate in proposing school lunch policies
2. Plan educational projects to:
   a. Interpret the school lunch program to others
   b. Improve dietary habits
   c. Provide guidance in social behavior
   d. Provide guidance in citizenship
   e. Improve the appearance of the lunchroom
   f. Improve the facilities of the school lunch program
   g. Help evaluate the lunch program
3. Assume some responsibilities for the operation of the school lunch program.

School F. This school is in an urban community and had facilities and space for serving one third of the pupils enrolled. Approximately that number ate in the lunchroom each day during most of the school year.

Although pupils in this school were participating to

some extent in activities concerned with the school lunch program, they were not encouraged to propose policies.

Educational projects related to the lunch program had been planned by pupils. A few high school homeroom teachers and some teachers of the elementary grades guided pupils in planning and carrying out activities designed to help other pupils understand school lunch policies. Pupils had written articles for the school paper explaining new policies. Also, children in the elementary grades had used posters to present facts concerning the nutritive value of the plate lunch and to provide guidance in improving dietary habits, social behavior and citizenship. Groups of high school pupils had helped improve the appearance of the lunchroom by decorating the dining room for special occasions. No student projects had been planned for repairing equipment or obtaining new equipment.

No evidence of an interest on the part of the pupils in evaluating any phase of the lunch program was apparent. The superintendent and school lunch manager believed that pupils might become interested in evaluating the program as a result of their continued participation in other school lunch activities. If so, they would be encouraged to help plan and carry out an evaluation program.

Some pupils were participating in the lunch program by working in the lunchroom during the serving period. Oppor-

tunities were provided for six high school pupils to assist with collecting money, cleaning the dining room and washing dishes. When asked what they had learned while working, these pupils reported that they were more aware of the cost of food, the importance of cleanliness in preparing and serving food, the advantages of planning work to save time and the necessity for keeping a correct count of lunches served and money collected.

Although comments from some of the pupils gave little evidence that they recognized the educational value of participating in the various school lunch activities, there was indication that pupils were interested in planning and carrying out projects related to the school lunch.

The interest of the pupils of this school in the lunch program and the extent to which they were participating in the program were due apparently to the fact that the school lunch manager and the administrator encouraged both pupils and teachers to assume and share responsibilities for promoting the educational effectiveness of the program.

School B. This school, also located in an urban community, had facilities and space for serving lunches to approximately one third of the pupils but only rarely did that number eat in the lunchroom.

Pupils had participated to only a limited extent in educational activities related to the school lunch program.

They had not been given an opportunity to propose policies. However, the interview with the superintendent revealed that he was interested in encouraging pupils to help propose policies for the school lunch program. Because of his concern about the lack of interest on the part of the pupils in the lunch program the administrator, who had just recently assumed his duties in this school, was promoting the organization of a student school lunch committee. His first step had been to call together two representatives from each class from grades one through 12 to discuss the school lunch program. No formal organization had as yet been established but he anticipated that the pupils would suggest policies which might improve the lunch program and that eventually committees would be organized for that purpose.

Pupils had not planned educational projects to assist the school lunch program. The only students who had participated in any phase of the lunch program were three girls who served food and washed dishes in exchange for their lunch. They reported that they liked the work and had learned about the importance of personal cleanliness while working around food.

The school lunch personnel in this school believed that the current lack of facilities and sufficient employees would make it impossible to cooperate with students in planning and carrying out projects related to the school lunch.

The superintendent indicated that improvement in the physical facilities and space for the lunch program might increase its educational potentialities. However, he also thought that if students were encouraged to participate extensively in the lunch program, even though the space and facilities are inadequate, they might become interested enough to work together to increase the educational effectiveness of the program as well as to improve its facilities.

The professionally trained manager and the school lunch personnel contribute to the educational effectiveness of the school lunch program

The professionally trained manager and the school lunch personnel should be encouraged to:

1. Cooperate in proposing policies for the lunch program
2. Cooperate in planning school lunch projects planned by pupils
3. Supervise pupils in work experiences in the lunchroom
4. Give guidance during the serving period
5. Cooperate in planning the correlation of the lunch program with class activities
6. Assist in evaluating the lunch program

7. Attend school lunch training courses or conferences.

School I. Evidence was secured that the school lunch personnel in this school contributed to the educational effectiveness of the lunch program in several ways. These employees were given the opportunity to propose policies for the lunch program as well as to enter into final decisions regarding the adoption of new policies. The personnel was encouraged to do this at regular meetings of the employees from lunch programs in the various schools of the city. Most of the policies discussed at these meetings were those concerning the preparation and service of food.

School lunch personnel had assisted the pupils of the sixth grade in planning and carrying out a project relating to the lunch program. Some pupils helped collect money, check meal tickets, wash dishes and clean the dining room tables during the lunch period. The employee responsible for each of these aspects of the work helped the pupils plan their work experiences and supervised the pupils during the time they were working in the lunchroom.

The employees gave guidance to pupils during the lunch period. When serving food the personnel urged pupils to eat some of each food on the menu and to drink milk; answered questions about the food and served new foods in small amounts.

There was evidence that school lunch personnel was

given some opportunity to work with teachers and pupils to correlate school lunch experiences with class activities. The employees had cooperated with one teacher in planning for her class to visit the lunchroom to observe food preparation. Another teacher asked the cook-manager periodically to show the storeroom to the pupils in her class and to tell them something about the food while they checked the labels on the packages to learn where the different foods were produced or manufactured. The employees indicated an interest in working with teachers to plan more of these experiences.

There was indication that the school lunch personnel in this school assumed some responsibility for the evaluation of the lunch program. At frequent intervals the amount of each food returned by the pupils was weighed to show what kinds of foods were not eaten and what amount of each food was being returned. The cook-manager estimated the operating costs each day while the costs for the month, the nutritional adequacy of the menus and the cleanliness and adequacy of the facilities were evaluated regularly by the city school lunch supervisor.

The employees of this lunch program attended conferences regularly. These conferences, conducted by the supervisor of the lunch program for the school system of the city, were for the purpose of training the personnel in the management and operation of the school lunch.

School E. In contrast to School I, the data obtained from this school indicated that the school lunch personnel had contributed to the educational effectiveness of the lunch program to a very limited extent. The cook was the only full-time school lunch employee in this small elementary school and one member of the community managed the program. The two discussed policies and made final decisions concerning policies to be established. The manager explained the policies when there was a need for a better understanding on the part of the teachers and pupils.

No opportunity had occurred for the personnel to cooperate in planning school lunch projects planned by pupils or supervise pupils in work experiences since the students in this school did not participate in activities related to the lunch program.

The cook made some attempt to give guidance through direct contact with pupils and teachers while serving the food but reported that she did not have sufficient time to do this consistently. She urged pupils to try new foods and to accept milk.

Both the cook and the manager expressed a desire to work with pupils, teachers and members of the community to plan work experiences and correlate class activities with the lunch program but in their judgment there had been little opportunity for this. They believed that if pupils and

teachers had the time to cooperate in such planning, not only could the program be more effective educationally but the facilities, food production and services could be improved.

There was no evidence that the school lunch personnel had participated in evaluating the lunch program. Neither the cook nor the manager had attended a training course or conference for school lunch personnel.

Community members participate in the school lunch program

There are several opportunities for community members to participate in the school lunch program. They can:

1. Propose policies for the school lunch program
2. Cooperate in interpreting policies to other members of the community
3. Increase the availability of community resources to the school lunch program
4. Assist in an evaluation program.

School A. Members of the community played an active role in several phases of the lunch program in this school which is in a rural community. The superintendent reported that most of the adults in this community were members of one or more of ten school lunch committees organized by the Parent-Teacher Association to manage and operate the lunch program. Teachers were also members of these committees.

There were many opportunities for parents and other community members to propose policies which they believed desirable for the lunch program. The members of committees proposed policies concerning the cost of the lunch, qualifications for employees, methods of financial control, improvement of the appearance and physical facilities of the lunchroom, menu planning, a food production program; they helped explain the purposes and policies of the lunch program to the school and the community.

The group making final decisions regarding all proposed policies included a representative from each of the ten lunch committees. The school administrator was a member of the policy-formulating group and promoted its continued functioning by administering the lunch program according to the policies accepted by this group and by delegating specific responsibilities to the community school lunch committees.

One committee interpreted school lunch policies to the teachers and the community regularly at Parent-Teacher Association meetings.

Another committee was responsible for increasing the availability of the community resources to the school lunch program. Some members of the community had assisted in acquiring equipment and decorating the lunchroom. An example of how several committees had worked together to make

community resources available was cited by one of the members of the committee. After a representative of one committee had discussed with parents the need for increasing the price of the school lunch, community members studied the problem and proposed that they take some responsibility for donating foods to the lunch program so that the price of the lunch would not need to be increased. The policy-formulating group accepted this suggestion and a committee collected, preserved and stored the donated food.

There was evidence that some phases of the lunch program had been evaluated by community members. At irregular intervals the committee responsible for menu planning had measured the amount and kind of food returned by the pupils. The finance committee evaluated costs periodically in order to determine whether the food the community was donating to the school was effective in decreasing the food costs.

School B. No evidence was obtained that members of the community participated in the lunch program in this school which is located in an urban community. The administrator expressed concern over the apparent lack of interest on the part of the parents in the success of the school lunch program. Approximately one fourth of the pupils had been buying their lunch at school. The superintendent believed that more than one half of the pupils would eat in the school lunchroom if the program could be

interpreted to the community and the facilities of the lunch program improved. However, there was equipment and space for serving only one third of the enrolled pupils.

The administrator indicated a desire to encourage community members to participate in the lunch program and asked about the kinds of opportunities he might provide for such participation.

## DISCUSSION AND RECOMMENDATIONS

Six criteria have been proposed for determining to what extent a school lunch program is an integral part of a school's educational program. It is assumed that a school in which the lunch program is educationally effective would carry out most of the educational practices included in the schedule that has been developed in this study. This schedule can serve as a guide for increasing the educational effectiveness of the lunch program by suggesting possibilities for making the school lunch educational. The educational potentialities of a lunch program depend upon the combination of the abilities and philosophies of the school administrator, the teachers, pupils, community members, school lunch managers and other school personnel as well as on the resources of the school plant and the community.

Through the use of the schedule, the educational practices of a school which relate to the lunch program can be evaluated. It is recommended that federal or state agencies employ the schedule to determine the extent to which lunch programs are an integral part of total school programs and to secure some knowledge of the attitudes of the schools and communities regarding the educational potentialities of such programs. On the basis of a knowledge of these basic

beliefs and concepts and of the extent to which certain criteria are or are not fulfilled, suggestions can be made to the schools and communities for making the school lunch program educational.

State supervisors could use the schedule to determine the needs of a group of schools or individual schools for assistance in planning methods whereby one or more of the criteria can be fulfilled. The educational practices relating to the lunch program can be determined for a number of schools within a designated area through using the schedule developed for this study.

The schedule is further recommended for use by school personnel or members of a community who are interested in increasing the educational effectiveness of their school lunch program. Although questions for the schedule were planned to elicit, by interview, specific information and the beliefs and attitudes of the various school personnel to whom they were directed, they can be revised for use by school personnel or members of a community as an appraisal form or check-list. Through the use of the schedule, the extent to which a school is fulfilling the criteria can be determined and the school and community can become more aware of the possibilities which exist for making the lunch program an integral part of the total school program.

## SUMMARY

This study was concerned with two aspects of lunch programs in Iowa schools, their management and operation and means of determining educational opportunities which they afford. The efficient management and operation of lunch programs to provide adequate meals and the realization of the educational potentialities are recognized as important factors in achieving the objectives of such programs.

### Part I. Management Aspects of School Lunch Programs in Iowa

The purpose of this part of the study was to investigate problems involved in the management and operation of lunch programs in Iowa schools. This research was a part of the Iowa State College Agricultural Experiment Station Research project 1021, the Nutritional Status of Iowa School Children: the School Lunch as a Contributing Factor.

During the school year of 1948-49 data were collected in a sample of 25 Iowa public schools drawn at random and representing the schools where full meals were served at noon and which were classified according to the population of the city or town in which they were located and to the kind of school, junior and senior high schools, elementary

schools and schools with 12 grades in one unit.

Using a schedule which had been developed by the Bureau of Human Nutrition and Home Economics (25), two days were spent in each school to obtain data concerning the number of persons participating in the lunch program, the amount of labor time involved in preparing and serving the lunch, the factors affecting labor time, the income and expenditures, and the acceptability and nutritive value of the lunches served.

For each management aspect studied, the data and averages for the entire group of schools and for each of the three groups of schools were presented and discussed with reference to other school lunch studies and accepted standards. The averages for the three groups of schools appear in the following sequence: high schools, elementary schools and schools with 12 grades.

Thirty-six per cent of the pupils enrolled in 24 Iowa schools ate the lunch served at school and the averages were 25.7, 25.3 and 70.9 per cent for participation in the three groups of schools. In general the average percentage participation was lower for the Iowa schools than that reported for other schools.

Certain measures of management aspects were analyzed statistically; some of the data were tabulated for use in

estimating the number of schools to include in a sample for further management studies. Analyses of covariance indicated that other than variation attributed to the number of lunches served, there were real differences among the three groups of schools in the amount of labor time scheduled for the school lunch personnel, the kitchen area, and the labor, other and total cost of operating the lunch programs; there were no real differences in the food cost for the year. Other than variation due to seating capacity, there were real differences in the dining table area but not in the dining room area. There was wide variation among schools within each group in the cost of the food and the dining room area provided.

The average number of lunches served per man-hour of labor for 24 schools was 7.9 and the averages were 7.2, 8.0 and 8.3 for the three groups of schools. The average per lunch labor time used in the three groups of schools was 8.4, 7.0 and 7.2 minutes and was 7.5 for 24 schools. The average number of lunches served per minute per serving line was 7.2 for 24 schools. These rates of production and service were believed to have been affected by division of the labor time, amount of space and layout of the kitchen and dining room, training and experience of the workers and organization of the work.

The percentage distribution of total labor time for 24 schools showed that approximately one third of the time was used for food preparation, one third for cleaning and one fifth for serving. In the high schools and elementary schools the greatest average percentage of labor time was expended for cleaning while in the schools with 12 grades the greatest was spent for food preparation. The proportion of time spent for preparation, service, cleaning and other work varied according to the organization of work, the number and kind of food items served, the condition of the kitchen and dining room, the amount and type of equipment available, the time spent in supervising work, preparing financial reports, time for eating and resting and the number of special cleaning duties required of the lunch personnel.

The average amount of kitchen area provided in the 25 schools was 2.3 square feet per lunch served; the averages for the three groups of schools were 3.34, 1.50 and 2.03 square feet. In 21 schools the kitchen space exceeded suggested minimum standards while in 16 schools the dining space was inadequate.

For the 25 schools the average length of the total basic food preparation route was 57.55 feet and for the three groups of schools was 86.87, 51.12 and 46.99 feet. The fact that in some large kitchens the basic food route

was shorter and in some small kitchens was longer was attributed to the arrangement of the equipment and the location of the serving area in relation to the preparation area.

The organization of the work, the type of supervision and the training and experience of the employees varied among the three groups of schools.

There seemed to be some relationship between the amount of labor time expended per meal and the per meal kitchen and dining room area and the length of the basic food route. The extent to which these factors and the organization of work affected the labor time was difficult to determine since it was recognized that the number of lunches served, the training and experience of the personnel, the work habits of the individual workers, the amount and kind of equipment available, the number and type of food items prepared and served, and the number of cleaning duties required of the personnel are other factors which influence the amount of labor time expended per meal.

Most of the schools in the larger cities had more institution type kitchen equipment than the elementary schools in smaller towns and the schools with 12 grades regardless of the number served. None of the schools having 12 grades was provided with adequate kitchen equipment.

The average percentages of income received from federal

funds were 14, 19.97 and 20.79 for the three groups of schools. The average percentages of income used for food were 54.13, 52.68 and 61.16 respectively and the average was 56.84 for 22 schools; the percentages for labor were 30.19, 33.95 and 31.76 and the average was 31.75; the percentages for other costs were 15.68, 13.37 and 7.09 and the average was 11.41. The average ratio for food to labor cost for 22 schools was 1.8 to 1. Factors which seemed to influence the percentage of the income used for food and labor were food prices, wage levels, monetary value of donated commodities used and other expenses paid from school lunch funds.

The average total cash received per revenue lunch served during the school year of 1948-49 in 22 schools was 27.3 cents and for the three groups of schools the averages were 32.5, 26.2 and 24.8 cents.

The average per meal total cost for the year was 26.5 cents for 22 schools and 31.6, 24.4 and 24.6 cents for the three groups of schools. The per meal food costs were 17.1, 12.8 and 15.1 for the three groups of schools and averaged 15.1 cents for 22 schools; the labor costs were 9.5, 8.3 and 7.8 cents and averaged 8.4 cents; the other costs were 5, 3.3 and 1.7 cents and averaged 3 cents per lunch served.

For 24 schools the total weight of the food returned averaged 5.9 pounds per 100 students served. Of the total

amount of food served in these schools, 5.08 per cent was returned, in the high schools 2.41 per cent, elementary schools 6.34 and schools with 12 grades 5.49. Salads, vegetables, desserts, main dish items, breads and sandwiches, milk, fruits and fruit juices were returned in the order of decreasing amounts.

The nutritional adequacy of a standard portion of each menu item and of the total lunch prepared were determined on the basis of the percentage which each supplied of the nutritional allowances recommended by the National Research Council for a child ten to 12 years old.

One third of the allowances was met by the average amounts of nutrients supplied by the lunches prepared in 24 schools except for calories and iron. Vitamin A was inadequate in the high school lunches, calories, protein, iron, thiamine and niacin in the elementary school lunches and calories and iron in the lunches served in the schools with 12 grades. When the nutritional adequacy of the lunches prepared in the high schools was determined on the basis of the dietary allowances for boys from 13 to 15 years and in the elementary schools for children from seven to nine years, all nutrients were adequate for the elementary school lunches while only protein, thiamine, riboflavin and ascorbic acid were adequate for the high school lunches.

In general the menu items in the more nutritionally adequate lunches were relatively more expensive and required more preparation time than those in the less adequate lunches.

On the basis of the findings of the present research it was recommended that:

1. Training conferences and short courses for school lunch personnel should emphasize the planning of adequate menus with consideration for the efficient use of labor time, utilization of foods which supply the most nutrients in relation to their cost and optimum use of donated commodities.
2. School administrators and lunch personnel should request assistance and suggestions from the state school lunch personnel for planning and adequately equipping school lunch kitchens.
3. The size of the sample for further studies of certain management aspects should be estimated on the basis of the statistical data provided by this basic research study.
4. When data regarding school lunch management and operation are analyzed, the schools should be classified according to type of school and number of lunches served.

5. A more extensive study should be made to determine the more specific factors influencing participation.
6. A comparison of labor time and cost in schools where different types of workers are employed should be made to provide information basic for more efficient organization of work and control of labor costs.
7. The adequacy of the dining room space and facilities and the needs for improvement should be determined in a more comprehensive study.
8. A more extensive study of school lunch expenditures for a year, particularly in the schools with 12 grades, should be conducted to determine operating costs representative for the schools in the state.
9. Financial policies regarding the provision of services for special functions should be established.
10. The monetary value of the donated commodities used during a year should be determined and the nutritive value calculated to demonstrate the financial and nutritional contributions to the school lunch program.
11. Further studies should be made regarding the amount and kind of food returned, the number of menu items returned per student, reasons for returning items and portion sizes to indicate pertinent factors regarding acceptability of food.

12. For comparative purposes data regarding the food returned in the schools with 12 grades should be recorded separately for the elementary and high school students.

13. To ascertain the acceptability of foods and provide information for planning school lunches, menu items should be classified as follows: meats, fish and poultry; meat substitutes; cooked vegetables; salads, including raw vegetables; sandwiches and breads; desserts; fruits; fruit juices and milk.

14. Portions of food should be varied to meet the nutritional needs of the children served.

15. The nutritive value of the standard portions prepared and the average portions served and consumed should be calculated and compared to determine the adequacy of the lunches prepared, served and consumed.

16. The findings of the present research should be made available to those concerned with school lunch programs in order that similar data for individual programs could be compared and specific problems involved in achieving the standards suggested for lunch programs could be ascertained.

## Part II. Educational Criteria for School Lunch Programs

The purpose of this part of the study was to develop a set of criteria which can be used to determine to what extent a school lunch program is an integral part of the total school program.

On the basis of personal experience and observation, a review of the literature and of beliefs and opinions expressed by persons concerned with the educational effectiveness and objectives of school lunch programs, a concept was developed of the basic characteristics which are essential for a school lunch that is an integral part of the school program. After reviewing these basic characteristics, the following general criteria were proposed as a basis for determining to what extent a school lunch is an integral part of the total school program:

1. There are sound policies for the administration of the school lunch program
2. The school administrator assumes the responsibility for the administration of the school lunch program
3. Teachers assume and share responsibilities for promoting the educational effectiveness of the school lunch program
4. Pupils participate in educational activities related to the school lunch program

5. The professionally trained manager and the school lunch personnel contribute to the educational effectiveness of the school lunch program
6. Community members participate in the school lunch program.

In order to define more clearly the characteristics of a lunch program which is integrated into the total school program, specific educational practices were accumulated and classified according to the six proposed criteria. These practices included those described in literature, secured from observation in schools and from ideas suggested by lunch supervisors, managers, school administrators and teachers.

Using these classified practices, a schedule of questions was developed for obtaining data believed to be necessary for determining to what extent the proposed criteria are fulfilled in a given school. The schedule included questions to be answered by the school administrator, teachers, pupils, school lunch personnel and community members.

Before attempting to use the schedule, the proposed criteria and the schedule were reviewed by a state director, nutritionist and field supervisor and a federal supervisor of school lunch programs. They accepted the proposed criteria as an adequate basis for determining to what extent a school lunch is an integral part of the total school pro-

gram. They also believed the educational practices to be practicable and desirable characteristics of school lunch programs.

The adequacy of the schedule to supply the information believed necessary to evaluate a school lunch program in relation to the proposed criteria was checked further by pre-testing in two schools. As a result of this pre-test, changes were made in some questions and in the form for recording the data in order to provide more adequate information and to simplify recording and tabulating the data.

The schedule of questions was then tested in ten schools including junior and senior high schools, elementary schools and schools with 12 grades in one unit. These schools provided a variety in size of enrollment, number of pupils served the lunch and the type of organization and management of the lunch program. The schedule was tested to determine whether the questions would elicit the information believed to be necessary, whether the schedule was applicable to these types of schools and whether the proposed criteria provided a practical basis for this kind of evaluation.

After each test of the schedule in the first six schools, revisions were made in some questions and the forms for recording the data. After these minor changes were made, the schedule was applicable to any one of the ten schools re-

gardless of the size of enrollment, the number of pupils served, the kind of management of the lunch program and the type of school.

For each criterion the practices of two schools were described to illustrate how the information provided by the schedule could be used to determine a school's educational practices relating to the lunch program.

The schedule developed in this study was recommended for use by:

1. Federal or state agencies to determine the extent to which lunch programs are an integral part of the total school program and to secure some knowledge of the attitudes of the schools and communities regarding the educational potentialities of such programs.
2. State supervisors to determine the needs of a group of schools or individual schools for assistance in planning methods whereby one or more of the criteria can be fulfilled.
3. School personnel or members of a community to determine the extent to which a school is fulfilling the criteria and to become more aware of the possibilities which exist for making the lunch program an integral part of the total school program.

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## ACKNOWLEDGMENTS

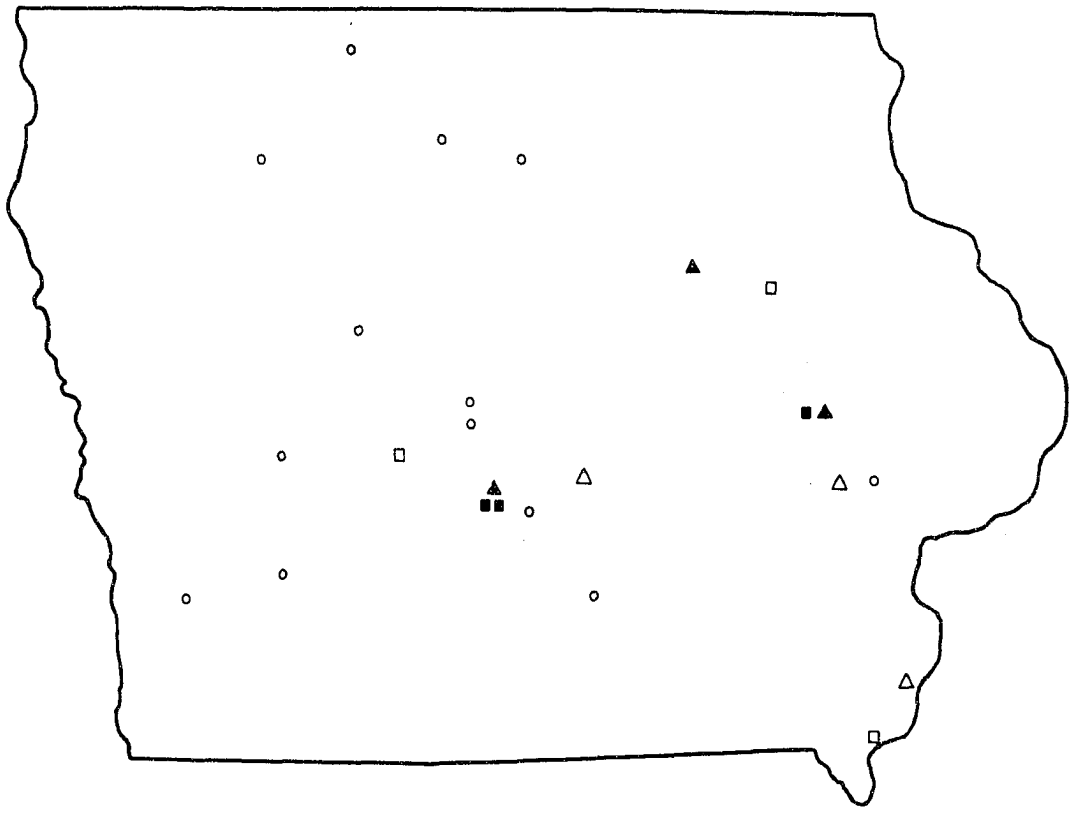
The author wishes to express sincere appreciation and gratitude to Dr. Grace M. Augustine, head of the Institution Management Department, and Dr. Hester Chadderdon, professor of Home Economics Education, for their invaluable guidance and assistance in developing and conducting the study; to the Iowa Department of Public Instruction and Mr. C. W. Bangs, Director of the Iowa School Lunch Program, for cooperation and assistance in making this study possible; to Dr. Emil H. Jebe, associate professor of Statistics, and Dr. Hildegarde Johnson, associate professor of Home Economics Education, for their guidance and counsel regarding the statistical analyses; and to the school administrators, teachers, students, managers and school lunch personnel in the schools studied for their cooperation and aid in collecting the data.

# APPENDICES

# APPENDIX A. RANDOM SAMPLE OF SCHOOLS FOR THE MANAGEMENT STUDY

Table 17. Code Numbers for Schools in Which Management Studies were Conducted

| | Population Group | Type of School | | |
|---|---|---|---|---|
| | | Junior and Senior High | Elementary | Grades 1-12 in One Unit |
| | Pilot Schools | 110 | - | 230 |
| 1. | Schools in cities with a population of 50,000 or over | 111<br>112<br>113 | 121<br>122<br>123 | -<br>-<br>- |
| 2. | Schools in cities with a population of one to 49,999 and schools in rural areas having grades one through 12 in one unit | 211<br>212<br>213 | 221<br>222<br>223 | 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>2310<br>2311<br>2312<br>2313 |
| 3. | Rural elementary schools | - | - | - |



Iowa Schools in Cities of 50,000 Population and over

▲ Junior and Senior High Schools
■ Elementary Schools

Schools in Cities and Towns of one to 49,999 Population and Schools Having Grades one through 12

△ Junior and Senior High Schools
□ Elementary Schools
○ Schools Having Grades one through 12

**Fig. 6 Location of Schools in Management Study**

## APPENDIX B. SCHEDULE USED FOR MANAGEMENT STUDY

Sample

FN 1039
B.B.-40-9-1857

U. S. DEPARTMENT OF AGRICULTURE
Bureau of Human Nutrition and Home Economics

SCHEDULE FOR SCHOOL LUNCH MANAGEMENT STUDIES

Date_____ School_____
Location_____

THE LUNCH:

| a | b | | c | d |
|---|---|---|---|---|
| Foods served | Size of serving | | Paid by children | Quantities and cost of all ingredients in the Type A lunch. (If donated, give source) |
| | Primary | Upper | | |

e. Paid by adults for Type A lunch_____.

f. Number of pupils served per minute at peak_____.

g. Reimbursement_____.

School_____

PARTICIPATION IN THE LUNCH:

1. Enrollment of school_____.

2. Number of lunches served:

| | a | | b | | c | | d | |
|---|---|---|---|---|---|---|---|---|
| | Type A | | Type ____ | | Type ____ | | Type ____ | |
| | Paying | Not paying | Paying | Not paying | Paying | Not paying | Paying | Not paying |
| Pupils | | | | | | | | |
| Teachers | | | | | | | | |
| Workers | | | | | | | | |
| Other adults | | | | | | | | |
| Total | | | | | | | | |

3. Home packed lunches brought by pupils.

   a. Number_____.

   b. Where eaten_____.

   c. Number buying milk_____.

School_____

ACCEPTABILITY OF FOODS SERVED IN THE TYPE A LUNCH:

| a | b | c | d | e |
|---|---|---|---|---|
| Foods | Appearance | Flavor | Number leaving | Weight of food left |

School_____

THE WORKERS AND THEIR DUTIES (Manager, cook, other paid adults, volunteer adults, paid pupils, other pupils).

| a | b | c | d | e |
|---|---|---|---|---|
| Workers | Hours worked | Wages | Training and experience | Job duties |

School_____

FLOW OF WORK (Time expended by individual workers on each operation, including use of power equipment and capacity utilized.)

School_____

LAYOUT OF SPACE AND EQUIPMENT (Sketch showing kitchen, storeroom and dining room with dimensions.)

School_____

FINANCIAL RECORD FOR THREE MONTHS OR LONGER PERIOD:

1. Dates for period covered_____.

2. Number of days lunch room operated during this period____.

3. Number served:

| | Paid | Free | Total |
|---|---|---|---|
| a. Type A lunches to pupils.... | | | |
| b. Type A lunches to adults.... | | | |
| c. Other lunches to pupils..... | | | |
| d. Other lunches to adults..... | | | |
| e. Milk only..... | | | |

4. Cash receipts:

a. Lunches.....$_____.

b. Ice cream.....$_____.

c. Candy and knick knacks.....$_____.

d. Federal payments.....$_____.

Total.....$_____

5. Expenditures:

a. Food.....$_____.

b. Labor.....$_____.

c. Repairs and replacements....$_____.

d. Other.....$_____.

Total operating cost$_____

6. Contributions.....$_____.

## APPENDIX C. DESCRIPTION OF THE 25 IOWA SCHOOL LUNCH PROGRAMS OBSERVED FOR THE MANAGEMENT STUDY[a]

School 111. (Type - junior and senior high; enrollment - 900; location - city, 72,000 population; date observed - 12/16/48; weather - rain and fog, 32 degrees F.; menu - Type A lunch, some a la carte items; service - trays.) Many of the students went home for lunch; there were no restaurants near the school. A cafeteria supervisor for school lunch programs in the city school system planned the menus and purchased certain foods. Canned foods and groceries were purchased from wholesale dealers and distributed to the schools. A cook-manager, who had been employed for ten years in college food service, organized the daily work schedule, ordered supplies from the central store room, purchased perishable foods from wholesale distributors and was responsible for the preparation of the main dish. The baker had worked for 26 years in school food service and the cook's helper had operated a tea room for ten years. There were six regular part-time employees who were homemakers with no previous food service experience. Duties were scheduled daily for each of the employees; they worked a

[a]Federal aid, reimbursement and U.S.D.A. commodities provided for all schools unless otherwise indicated.

specified number of hours each day. Plate waste was high because few pupils tasted the jellied cranberry salad which had never been served before in this school.

School 112. (Type - junior and senior high; enrollment - 1,170; location - city, 60,000 population; data observed - 11/17/48; weather - sun, 52 degrees F.; menu - Type A lunch, second portions provided; service - trays.) Those students who did not bring a lunch or eat in the school lunch went home at noon or ate in near by restaurants. The home economics teacher supervised the lunch program, planned the menus and purchased the food from wholesale dealers. A regular full-time employee directed the operation of the lunch program. This cook had worked for several years in a restaurant and for a catering service. The regular part-time dishwasher had not worked in any other type of food service establishment. Twenty-two girls in a quantity cookery class prepared and served the lunch using the home economics laboratory and equipment. The work schedule was planned by the home economics teacher. Each student worked one hour daily under the direction of the cook.

School 113. (Type - junior and senior high; enrollment - 1,400; location - city, 176,000; date observed - 10/13/48; weather - sun, 60 degrees F.; menu - plate lunch combination and a la carte menu items; service - trays; federal aid -

none.) Less than one half of the students went home for lunch and almost as many brought a lunch as ate in the lunchroom. There were few restaurants near the school. The lunch program was supervised by the persons responsible for the home economics and school lunch programs in the city school system. They planned the menus and purchased certain food. Food was obtained from wholesale dealers and distributed to the schools. A cook-manager directed the work of four regular full-time employees and nine student workers. She ordered perishable foods from wholesale firms. None of the workers had had previous experience in quantity food preparation and service. The manager planned work schedules daily and all employees followed a specific time schedule which included periods for rest and lunch.

School 211. (Type - junior high; enrollment - 440; location - city, 30,500 population; date observed - 5/4/49; weather - sunny, 88 degrees F.; menu - Type A lunch, second portions provided, candy and ice cream were sold in addition to the plate lunch; service - trays.) About one fourth of the enrolled pupils usually ate the school lunch, one fourth brought lunch from home and the remainder either went home for lunch or ate in nearby restaurants. On the day observed approximately one half of the students who usually ate the school lunch ate elsewhere. The manager attributed this decrease to the fact that it was the first unusually

warm spring day of the year. The home economics teacher managed the lunch program, planned the menus and purchased the food from wholesale dealers. There were three regular full-time employees and 13 student workers. The three employees had completed a course for food handlers which was organized and provided by a county health organization. The home economics teacher planned detailed work schedules for all employees including time for special weekly cleaning. Since the school lunch kitchen was a part of the home economics laboratory, the work had to be completed before classes started at one o'clock.

School 212. (Type - junior and senior high; enrollment - 696; location - city, 17,000; date observed - 2/16/49; weather - snow, ice, 30 degrees F.; menu - a la carte menu items; service - trays; federal aid - none.) More than one half of the students ate in the school cafeteria or brought their lunch. The manager reported that on the day observed about 100 more students than usual ate in the cafeteria. This was attributed in part to the weather. No restaurants were located within walking distance of the school and many of the children lived too far from the school to go home at noon. The home economics teacher was the cafeteria manager and planned the menus, supervised the employees and purchased the food. All food was obtained at wholesale prices from

wholesale distributors. There were three regular full-time employees, two of whom had worked for nine years as school lunch cooks. Twenty-eight students worked during and after the serving period. The manager planned work schedules daily for all employees.

School 213. (Type - junior and senior high; enrollment - 1,028; location - city, 15,000 population; date observed - 1/26/49; weather - snow, ice, 0 degrees F.; menu - Type A lunch, second portions provided; service - plates.) A majority of the pupils went home for lunch; a few ate in near by restaurants. The high school home economics teacher supervised the five lunch programs in the city school system, planned the menus, made the financial reports, purchased the food and employed all personnel. Food was purchased in quantities for the five schools from wholesale firms. There were two regular full-time employees and one regular part-time and 11 student workers. None of the employees had had other experience in quantity food preparation and service. The head cook planned work schedules for the other employees. Some food was prepared in the afternoons for the following day.

School 121. (Type - elementary; enrollment - 497; location - city, 176,000 population; date observed - 12/1/48; weather - sun, 50 degrees F.; menu - Type A lunch, second

portions provided; service - trays.) Many of the pupils could go home for lunch. Data concerning the number who brought their lunch were not available. The lunch program was supervised by the persons responsible for the home economics and school lunch programs in the city school system. They planned the menus, employed the personnel and purchased certain food. Canned goods and groceries were purchased from wholesale firms and distributed to the schools. One regular full-time and one regular part-time employee prepared and served the food. Six students and one teacher worked one hour daily checking meal tickets, cleaning and washing dishes. The head cook, who was the only employee with experience in quantity food service, had worked for 26 years as a school lunch cook. She planned daily work schedules for all other workers and was responsible for purchasing perishable foods as needed.

School 122. (Type - elementary; enrollment - 648; location - city, 72,000 population; date observed - 12/7/48; weather - sun, 35 degrees F.; menu - Type A lunch, second portions provided; service - plates.) A majority of the pupils went home for lunch; there were no restaurants near this school. A cafeteria supervisor, who was responsible for all the lunch programs in the city school system, supervised the employees, planned the menus and purchased the canned foods and groceries from wholesale firms. There were

two regular full-time and two regular part-time employees. The head cook, who had worked for 15 years as a restaurant cook and six years as a school lunch cook planned the work schedules and ordered the perishable foods daily. Both employees worked according to a specific time schedule with periods allowed for lunch and rest. Food for 85 pupils was prepared and delivered to another school; labor time and costs for this service were not included in the data reported for this school.

School 123. (Type - elementary; enrollment - 892; location - city, 176,000 population; date observed - 10/27/48; weather - sun, 70 degrees F.; menu - Type A lunch, second portions provided; service - plates.) A majority of the pupils brought lunch from home or ate the school lunch. The lunch program was supervised by the persons responsible for the home economics and school lunch programs in the city school system. Canned foods and groceries were purchased by them in wholesale quantities and distributed to the schools. One of the three regular full-time employees had worked seven years as a hospital cook; the other two had been hospital and school lunch cooks for shorter periods of time. Five students helped scrape plates and wash dishes. The cook-manager planned daily work schedules including time for meals and rest periods. She purchased perishable

foods daily and was responsible for some food preparation.

School 221. (Type - elementary; enrollment - 201; location - town, 6,000 population; date observed - 11/10/48; weather - clouds, mist, 40 degrees F.; menu - Type A lunch, second portions provided; service - plates.) Approximately one half of the pupils ate the school lunch regularly. A majority of the remainder went home for lunch. A school lunch supervisor, who had worked previously in commercial food service, planned the menus and employed the personnel for the lunch programs in the city school system. A regular full-time cook and a baker planned their own daily work schedules according to a general plan suggested by the supervisor. The cook purchased most of the food from a retail store. Some canned foods were obtained from wholesale dealers. On the day observed, the portions of food seemed large for elementary pupils.

School 222. (Type - elementary; enrollment - 360; location - city, 15,000 population; date observed - 5/11/49; weather - sun, 80 degrees F.; menu - Type A lunch, second portions provided; service - plates.) During most of the school year, approximately one half of the pupils ate the school lunch. A majority of the remainder went home for lunch. On the day observed only one half of the number who regularly ate the school lunch stayed for lunch. That day

was one of the first unusually warm days of the year. The deficit incurred by serving lunches to a large number of students who were unable to pay was paid from the City Child Health Fund. The kindergarten teacher planned menus and prepared the financial reports for the lunch program. One regular full-time and one regular part-time employee planned their own work schedules according to the menus. The cook purchased food from a retail dealer who reduced the cost 10 per cent.

School 223. (Pupils from three schools were served in one lunchroom. Type - elementary; enrollment - 796; location - town, 5,000 population; date observed - 2/9/49; weather - snow, 10 degrees F.; menu - Type A lunch, second portions provided; service - trays.) This was the only school lunch program in the city and pupils were transported from other schools by bus. The report for this school includes data regarding the complete program provided for children attending the three schools. Many students went home for lunch and the superintendent reported that a majority who could not go home brought their lunch to school rather than travel to another building for the school lunch. According to the cook-manager, the number served on the day observed was approximately 50 per cent greater than usual. She attributed this increase to the weather. The cook-

manager planned the menus, purchased the food and was responsible for all food preparation and service. The food was purchased from a retail dealer who reduced the cost 10 per cent. A regular full-time helper was in charge of the dining room service and cleaning. Five students helped clean the dining room and wash dishes. Other than the pupils, each employee planned her work schedule according to the menu and remained at work for a specific number of hours daily. The helper planned the work schedules for the students.

School 231. (Type - Grades 1-12; enrollment - 103; location - town, 600 population; date observed - 10/2/43; weather - sun, 70 degrees F.; menu - Type A lunch, second portions provided; service - divided plates.) All but a few of the pupils in this school ate the school lunch; the remainder brought lunch from home. The superintendent's wife planned the menus and the superintendent was responsible for buying most of the food from wholesale dealers. There were two regular full-time employees; one had been a cook in a restaurant and a college residence hall, and one had worked in other school lunch kitchens for five years. The two employees divided the work and rotated duties each week, planning their own schedules according to the menu for the day. They were permitted to leave as soon as the work was completed for the day.

School 232. (Type - grades 1-12; enrollment - 114; location - town, 400 population; date observed - 11/31/48; weather - cloudy, 60 degrees F.; menu - Type A lunch, second portions provided; service - divided plates.) The pupils either ate the school lunch or went home at noon. Rarely did any one bring a lunch from home. The home economics teacher planned the school lunch menus. None of the employees had worked previously in quantity food service establishments. The head cook purchased the food from a retail dealer and prepared most of the food on the menu. A regular full-time assistant cook prepared the financial reports daily and was responsible for the cleaning. She helped prepare food when necessary. A regular part-time employee washed pots and pans and cleaned the dining room. A student worker checked meal tickets. Since the school lunch kitchen was part of the home economics laboratory, work had to be scheduled so that the room could be ready for afternoon classes at one o'clock.

School 233. (Type - grades 1-12; enrollment - 354; location - town, 700 population; date observed - 2/23/49; weather - sun, 49 degrees F.; menu - Type A lunch, second portions provided; service - divided plates.) Approximately one half of the pupils ate the school lunch, less than one fifth brought lunch and the remainder of the pupils went

home for lunch. The head cook, who had worked in the school lunch kitchen for three years, planned the menus, made the financial reports and purchased food from both retail and wholesale dealers. She planned the duties of the regular full-time assistant cook and regular part-time helper. The latter two employees had not had other experience in quantity food preparation and service. A student checked meal tickets and cleaned the dining room tables. All regular employees were permitted to leave as soon as the work for the day was completed.

School 234. (Type - grades 1-12; enrollment - 286; location - town, 500 population; date observed - 4/6/49; weather - cloudy, 40 degrees F.; menu - Type A lunch; service - plates.) A majority of the pupils ate the school lunch; the others went home at noon. The head cook, who had worked for eight years in the school lunch program, planned the menus, kept financial records, supervised the work of others, prepared the main dish and purchased the food. Bread was obtained from a wholesale dealer; other foods were purchased from retail stores. There were four regular full-time assistants. The work was scheduled daily including time for rest and eating lunch. All employees worked a specified number of hours. In the afternoon time for special cleaning and food preparation for the following day was scheduled.

School 235. (Type - grades 1-12; enrollment - 234; location - town, 300 population; date observed - 3/23/39; weather - fog, clouds, 32 degrees F.; menu - Type A lunch, second portions provided; service - divided plates.) A few pupils brought lunch from home and those who did not eat in the lunchroom went home for their noon meal. The home economics teacher was paid from school lunch funds for spending two hours daily in planning the menus, purchasing the food and making the financial reports. Most of the food was purchased from wholesale dealers. Three regular full-time employees were assigned responsibilities for food preparation, service and cleaning by the home economics teacher who made the work schedules. None of the employees had worked previously in other types of food service establishments. Four students helped clean the dining room and wash dishes.

School 236. (Type - grades 1-12; enrollment - 163; location - town, 300 population; date observed - 3/9/49; weather - cloudy, 38 degrees F.; menu - Type A lunch, second portions provided; service - divided plates.) Few of the students brought lunch from home; those who did not eat in the lunchroom went home at noon. A volunteer worker, who was a former teacher, planned menus, made the financial reports and purchased the food. Canned foods were obtained

from a wholesale dealer but other foods were purchased from a local retail store. Two regular full-time employees, with no former food service experience, divided the duties during the day. Each prepared one half of every food item and on alternate days washed and dried the dishes. Three teachers volunteered each noon to serve food. The food was prepared in a section of the home economics laboratory equipped for that purpose.

School 237. (Type - grades 1-12; enrollment - 232; location - town, 300 population; date observed - 4/27/49; weather - cloudy, 55 degrees F.; menu - Type A lunch, second portions provided; service - plates.) Very few students brought their lunch. Those who did not eat in the lunchroom usually went home for lunch. This program was sponsored by the mothers' school lunch club. A committee planned menus, the treasurer of the club prepared the financial reports and purchased the food. Canned foods were obtained from wholesale dealers, other foods from retail stores. One committee was responsible for planning the work and supervising the personnel. There were two regular full-time employees. Both had been required to have a medical examination and to sign a contract to work for one school year. One employee prepared the food; the other was responsible for washing dishes and cleaning and helped with food prepara-

tion when necessary. Neither had worked in other types of food service. Four students helped make sandwiches, scrape plates and clean the dining room.

School 238. (Type - grades 1-12; enrollment - 425; location - town, 1,000 population; date observed - 4/20/49; weather - sun, 50 degrees F.; menu - Type A lunch, second portions provided; service - plates.) Approximately one half of the pupils lived close enough to the school to go home for lunch; a few brought lunch from home. The home economics teacher planned menus, prepared financial reports and purchased food from wholesale dealers. There were four regular full-time employees; two had worked in the school lunch kitchen for three and four years. The cooks divided the work daily according to the menu. Three students worked during the lunch hour checking meal tickets and serving food. The equipment for preparing the school lunch was in the home economics laboratory and work had to be completed each day at one-thirty so that classes could meet there.

School 239. (Type - grades 1-12; enrollment - 140; location - town, 600 population; date observed - 3/29/49; weather - rain, 40 degrees F.; menu - Type A lunch, second portions provided; service - plates.) Approximately one half of the pupils usually ate lunch at school and the remainder went home at noon. The head cook, who had worked

for 25 years in a restaurant, planned the menus and was responsible for most of the food preparation. She purchased food from retail stores. The assistant cook had not had previous experience in quantity food preparation and service. Three students and the home economics teacher helped serve the lunch. The cooks, both regular full-time employees, divided the work according to the menu planned for the day. The home economics laboratory equipment was used for preparing the lunch and work had to be completed by one o'clock so that classes could meet in the laboratory. All of the information concerning the operation and management of this school lunch program was not obtained. Because of heavy rains and muddy roads, it was impossible to return to the school on the second day to secure the necessary data.

School 2310. (Type - grades 1-12; enrollment - 135; location - open country; date observed - 3/16/49; weather - cloudy, 28 degrees F.; menu - Type A lunch, second portions provided; service - plates.) Most of the pupils ate the school lunch or brought their lunch. Few lived close enough to go home at noon. The head cook planned the menus, prepared the main dish and purchased the food. Bread and milk trucks would not deliver to the school because of the condition of the roads; bread was made by the cooks and milk was obtained from a farm. Other foods were purchased from

a small retail store near the school. The food was prepared and served in the home economics laboratory. No home economics classes were being taught that year. The three regular full-time cooks had worked for at least five years in the school lunch program. They divided their work according to the menu planned and were permitted to leave as soon as the work for the day was completed.

School 2311. (Type - grades 1-12; enrollment - 124; location - village; date observed 1/19/49; weather - sun, 0 degrees F.; menu - Type A lunch, second portions provided; service - divided plates.) No students brought lunches from home and only a few went home at noon. Two regular full-time cooks, one with five years of restaurant experience and one with no food service experience, worked together to plan menus, purchase and prepare food and clean the equipment and kitchen. All food was purchased from a retail store except canned goods which they purchased from a wholesale distributor. The cooks rode on the school bus to and from work. It was necessary for them to plan schedules for preparing some food each day for the following day since they arrived at work too late to complete all preparation before lunch was served. Each week the Parent-Teacher Association provided a volunteer worker to help set tables and make sandwiches.

School 2312. (Type - grades 1-12; enrollment - 276; location - town, 400 population; date observed - 3/1/49; weather - cloudy, 32 degrees F.; menu - Type A lunch, second portions provided; service - metal trays.) A few pupils brought their lunch; the others who did not eat in the lunchroom went home at noon. None of the three regular full-time employees had worked in other types of food service organizations. The head cook planned menus, purchased food and prepared the main dish. Food was purchased from local retail merchants. The cook scheduled the work for the two assistants. Six students helped dry dishes, set tables and check meal tickets. The equipment for preparing the school lunch was located in a section of the home economics laboratory.

School 2313. (Type - grades 1-12; enrollment - 225; location - town, 150 population; date observed - 3/13/49; weather - sun, 62 degrees F.; menu - Type A lunch, second portions provided; service - divided plates.) All but a few students either brought their lunch or ate the school lunch. Some lived close enough to the school to go home at noon. The two regular full-time cooks had been employed in the school lunch program since October, 1947. They worked together planning menus, buying and preparing the food and cleaning. Food was purchased from a retail grocer

who reduced the food cost 10 per cent. Eight students helped make sandwiches, serve food, wash dishes and clean the dining room. The home economics laboratory was used as the school lunch dining room.

APPENDIX D. BASIC DATA FOR THE

Table 18. Portions of Foods Served, Consumed and R
of Pupils Returning Food in 26 Iowa Sch

| School | Menu Items | Standard Portion Oz. | Average Portion Served Oz. | F Aver Port Oz |
|---|---|---|---|---|
| 230 (May 4) | Creamed Potatoes | 4 | 7.40 | 7. |
| | Ground Minced Ham Sandwich | 2 | 2.20 | 2. |
| | Cabbage Salad | 1.5 | 1.30 | 1. |
| | Spiced Nut Cooky | 1 | .88 | . |
| | Milk | 8 | 7.53 | 7. |
| | Orange Juice | 4 | 4.81 | 4. |
| | Total | 20.5 | 24.12 | 23. |
| 230 (May 5) | Hamburger Gravy<br>Baking Powder Biscuit | 2 )<br>2 ) | 5.59 | 5. |
| | Green Beans | 2 | 1.72 | 1. |
| | Bread and Butter Sandwich | 1 | .97 | . |
| | Apple | 3 | 3.63 | 3. |
| | Milk | 8 | 7.77 | 7. |
| | Orange Juice | 4 | 4.83 | 4. |
| | Total | 22.0 | 24.51 | 24. |
| 230 (May 6) | Scalloped Potatoes and Ham | 6 | 7.05 | 6. |
| | Fruit Salad | 3 | 2.85 | 2. |
| | Bread and Butter Sandwich | 1 | 1.35 | 1. |
| | Milk | 8 | 8.00 | 7. |
| | Orange Juice | 4 | 4.44 | 4. |
| | Total | 22.0 | 23.69 | 22. |
| 110 | Baked Hash | 4 | 4.46 | 4. |
| | Baked Tomato and Bread | 3.5 | 1.65 | 1. |
| | Apple, Grape and Celery Salad | 2 | 2.18 | 2. |
| | Milk | 8 | 8.92 | 8. |
| | Total | 17.5 | 17.21 | 16. |

s Served, Consumed and Returned and the Number and Per Cent
ning Food in 26 Iowa Schools on the Day Observed

| ard on | Average Portion Served Oz. | Food Consumed: Average Portion Oz. | Food Consumed: Per Cent | Food Returned: Per Person Served Oz. | Food Returned: Per Person Returning Food Oz. | Students Returning Food: No. | Students Returning Food: % |
|---|---|---|---|---|---|---|---|
| | 7.40 | 7.22 | 97.97 | .18 | .70 | 48 | 25.81 |
| | 2.20 | 2.16 | 96.43 | .04 | .54 | 13 | 6.99 |
| 5 | 1.30 | 1.20 | 92.53 | .10 | .82 | 22 | 11.83 |
| | .88 | .84 | 95.15 | .04 | .80 | 10 | 5.38 |
| | 7.53 | 7.40 | 98.32 | .13 | 2.35 | 10 | 5.38 |
| | 4.81 | 4.80 | 99.72 | .01 | 2.50 | 1 | .54 |
| 5 | 24.12 | 23.62 | 97.94 | .50 | - | - | - |
| ) | 5.59 | 5.42 | 97.01 | .17 | .70 | 51 | 24.06 |
| ) | 1.72 | 1.66 | 96.43 | .06 | .68 | 19 | 8.96 |
| | .97 | .94 | 97.07 | .03 | .43 | 14 | 6.60 |
| | 3.63 | 3.63 | 100.00 | .00 | .00 | 0 | 0.00 |
| | 7.77 | 7.68 | 98.82 | .09 | 1.18 | 6 | 2.83 |
| | 4.83 | 4.78 | 99.02 | .05 | .14 | 4 | 1.89 |
| 0 | 24.51 | 24.11 | 98.35 | .40 | - | - | - |
| | 7.05 | 6.80 | 96.42 | .25 | 1.30 | 39 | 19.70 |
| | 2.85 | 2.70 | 94.86 | .15 | 1.32 | 22 | 11.11 |
| | 1.35 | 1.26 | 93.38 | .09 | 1.48 | 12 | 6.06 |
| | 8.00 | 7.80 | 97.47 | .20 | 2.53 | 7 | 3.53 |
| | 4.44 | 4.30 | 96.82 | .14 | ? | ? | ? |
| 0 | 23.69 | 22.86 | 96.49 | .83 | - | - | - |
| | 4.46 | 4.33 | 97.08 | .14 | 1.19 | 18 | 10.91 |
| 5 | 1.65 | 1.30 | 78.86 | .35 | 2.13 | 27 | 16.36 |
| | 2.18 | 2.14 | 98.47 | .03 | .69 | 8 | 4.85 |
| | 8.92 | 8.79 | 98.54 | .13 | .98 | 22 | 13.33 |
| 5 | 17.21 | 16.56 | 96.22 | .65 | - | - | - |

Table 18 (Continued)

| School | Menu Items | Standard Portion Oz. | Average Portion Served Oz. | Food Co<br>Average Portion Oz. |
|---|---|---|---|---|
| 111 | Beef Burger and Bun, Butter | 4.25 | 5.20 | 5.08 |
| | Mashed Potatoes and Gravy | 6 | 6.92 | 6.67 |
| | Cranberry Salad | 2 | 2.41 | 1.82 |
| | Whole Wheat Bread and Margarine Sandwich | 2 | 5.27 | 5.18 |
| | White Cake with Cherry Sauce | 4 | 1.15 | 1.03 |
| | Milk | 8 | 7.19 | 6.98 |
| | Orange and Grapefruit Juice | 2 | 1.63 | 1.57 |
| | Total | 28.25 | 29.77 | 28.33 |
| 112 | Toasted Cheese on Bun | 4 | 3.23 | 3.18 |
| | Creamed Peas | 4 | 4.25 | 4.18 |
| | Apple Salad | 3 | 3.68 | 3.54 |
| | White Cake and Brown Sugar Sauce | 3 | 2.46 | 2.35 |
| | Milk | 8 | 8.42 | 8.21 |
| | Orange Juice | 6 | 5.89 | 5.80 |
| | Total | 28 | 27.93 | 27.26 |
| 113 | Hot Roast Beef Sandwich | 3.8 | 8.37 | 8.37 |
| | Mashed Potatoes | 3 | | |
| | Fruit Gelatin | 2 | 2.79 | 2.66 |
| | Milk | 8 | 11.16 | 11.14 |
| | Total | 16.8 | 22.32 | 22.17 |
| 121 | Beef and Gravy | 2 | 6.43 | 6.29 |
| | Mashed Potatoes | 3 | | |
| | Carrots, Raw | 1 | 1.11 | 1.11 |
| | Celery, Raw | .5 | .51 | .47 |
| | Fruit Gelatin | 3 | 3.48 | 3.45 |
| | Beef and Margarine Sandwich | 1.25 | 1.12 | 1.08 |
| | Milk | 8 | 10.32 | 10.25 |
| | Total | 17.75 | 22.97 | 22.65 |

Table 18 (Continued)

| i | Average Portion Served Oz. | Food Consumed: Average Portion Oz. | Food Consumed: Per Cent | Food Returned: Per Person Served Oz. | Food Returned: Per Person Returning Food Oz. | Students Returning Food: No. | Students Returning Food: % |
|---|---|---|---|---|---|---|---|
| | 5.20 | 5.08 | 97.77 | .12 | 1.08 | 19 | 10.73 |
| | 6.92 | 6.67 | 96.47 | .24 | 2.54 | 17 | 9.60 |
| | 2.41 | 1.82 | 75.12 | .60 | 2.17 | 49 | 27.68 |
| | 5.27 | 5.18 | 98.34 | .09 | .46 | 34 | 19.19 |
| | 1.15 | 1.03 | 90.41 | .12 | 1.19 | 18 | 3.39 |
| | 7.19 | 6.98 | 97.11 | .21 | 1.53 | 24 | 13.56 |
| | 1.63 | 1.57 | 96.53 | .06 | 3.33 | 3 | 1.69 |
| | 29.77 | 28.33 | 95.18 | 1.44 | - | - | - |
| | 3.23 | 3.18 | 98.51 | .05 | .23 | 20 | 17.54 |
| | 4.25 | 4.18 | 98.50 | .06 | 3.45 | 21 | 18.42 |
| | 3.68 | 3.54 | 96.07 | .14 | .75 | 22 | 19.30 |
| | 2.46 | 2.35 | 95.62 | .11 | 2.04 | 6 | 5.26 |
| | 8.42 | 8.21 | 97.55 | .21 | 2.61 | 9 | 7.89 |
| | 5.89 | 5.80 | 98.36 | .10 | 3.67 | 3 | 2.63 |
| | 27.93 | 27.26 | 97.61 | .67 | - | - | - |
| | 8.37 | 8.37 | 100.00 | .00 | .00 | 0 | 0 |
| | 2.79 | 2.66 | 95.21 | .13 | .77 | 15 | 17.44 |
| | 11.16 | 11.14 | 99.84 | .02 | .75 | 2 | 2.32 |
| | 22.32 | 22.17 | 99.32 | .15 | - | - | - |
| | 6.43 | 6.29 | 97.91 | .13 | 1.14 | 11 | 11.83 |
| | 1.11 | 1.11 | 100.00 | .00 | .00 | 0 | 0 |
| | .51 | .47 | 91.67 | .04 | .57 | 7 | 7.53 |
| | 3.48 | 3.45 | 92.15 | .04 | 4.06 | 8 | 8.60 |
| | 1.12 | 1.08 | 96.87 | .03 | .51 | 6 | 6.45 |
| | 10.32 | 10.25 | 99.27 | .08 | 1.17 | 6 | 6.45 |
| | 22.97 | 22.65 | 98.60 | .32 | - | - | - |

Table 18 (Continued)

| School | Menu Items | Standard Portion Oz. | Average Portion Served Oz. | Food Consumed Average Portion Oz. | Per |
|---|---|---|---|---|---|
| 122 | Potato Soup | 6 ) | | | |
| | Crackers | .5 ) | 5.10 | 4.34 | 85. |
| | Carrots, Raw | .5 | .55 | .40 | 73. |
| | Cheese Sandwich | 1.25 | 1.85 | 1.53 | 82. |
| | Gingerbread | 1.5 | 1.78 | 1.63 | 92. |
| | Orange Juice | 4 | 4.41 | 4.38 | 99. |
| | Milk | 8 | 9.89 | 9.50 | 96. |
| | Total | 21.75 | 23.58 | 21.78 | 92. |
| 123 | Baked Hash | 5 | 4.62 | 4.31 | 93. |
| | Stewed Tomatoes | 3 | 2.44 | 2.22 | 91. |
| | Apple Crisp ) | | | | |
| | Whipped Cream ) | 2.5 | 3.08 | 2.94 | 95. |
| | Whole Wheat Bread and Margarine Sandwich | 1 | 1.22 | 1.17 | 96. |
| | Milk | 8 | 8.52 | 8.35 | 97. |
| | Total | 19.5 | 19.88 | 18.99 | 95. |
| 211 | Barbecued Hamburger and Bun | 3.25 | 2.90 | 2.86 | 98. |
| | Potato Chips | 1 | 1.04 | 1.03 | 98. |
| | Creamed Peas | 2 | 2.55 | 2.48 | 97. |
| | Celery Sticks | .5 | .52 | .46 | 87. |
| | Tutti Fruiti Ball | .75 | .47 | .42 | 89. |
| | Bread Pudding, Vanilla Sauce | 2 | 2.38 | 2.35 | 98. |
| | Milk | 8 | 8.00 | 8.00 | 100. |
| | Orange Juice | 4 | 2.90 | 2.90 | 100. |
| | Total | 20.5 | 20.76 | 20.50 | 98. |
| 212 | Scalloped Ham and Noodles | 5 | 5.00 | 4.93 | 98. |
| | Peas, Canned | 3 | 3.00 | 2.97 | 99. |
| | Carrots, Raw ) | .5 ) | 1.01 | 1.00 | 98. |
| | Celery Sticks ) | .5 ) | | | |
| | Roll and Butter | 1.3 | 2.03 | 2.03 | 100. |
| | Chocolate Cake | 2 | 2.08 | 2.08 | 100. |
| | Milk | 8 | 8.00 | 8.00 | 100. |
| | Total | 20.3 | 21.12 | 21.01 | 99. |

Table 18 (Continued)

| rd a | Average Portion Served Oz. | Food Consumed: Average Portion Oz. | Food Consumed: Per Cent | Food Returned: Per Person Served Oz. | Food Returned: Per Person Returning Food Oz. | Students Returning Food: No. | Students Returning Food: % |
|---|---|---|---|---|---|---|---|
| ) ) | 5.10 | 4.34 | 85.04 | .75 | 2.87 | 54 | 11.83 |
| | .55 | .40 | 73.66 | .15 | .42 | 70 | 34.48 |
| | 1.85 | 1.53 | 82.45 | .33 | .94 | 70 | 34.48 |
| | 1.78 | 1.63 | 92.15 | .14 | .81 | 35 | 17.24 |
| | 4.41 | 4.38 | 99.19 | .04 | .83 | 9 | 4.43 |
| | 9.89 | 9.50 | 96.00 | .40 | 5.39 | 96 | 7.88 |
| | 23.58 | 21.78 | 92.35 | 1.80 | - | - | - |
| | 4.62 | 4.31 | 93.17 | .31 | 1.71 | 45 | 18.44 |
| | 2.44 | 2.22 | 91.02 | .22 | 1.49 | 36 | 14.76 |
| | 3.08 | 2.94 | 95.38 | .14 | 1.65 | 21 | 8.61 |
| | 1.22 | 1.17 | 96.62 | .04 | .45 | 22 | 9.02 |
| | 8.52 | 8.35 | 97.92 | .18 | 1.73 | 25 | 10.24 |
| | 19.88 | 18.99 | 95.07 | .89 | - | - | - |
| | 2.90 | 2.86 | 98.75 | .04 | .83 | 3 | 4.35 |
| | 1.04 | 1.03 | 98.96 | .01 | .19 | 4 | 5.84 |
| | 2.55 | 2.48 | 97.16 | .07 | 1.00 | 5 | 7.20 |
| | .52 | .46 | 87.50 | .06 | .75 | 6 | 8.69 |
| | .47 | .42 | 89.23 | .05 | 1.75 | 2 | 2.90 |
| | 2.38 | 2.35 | 98.93 | .03 | .88 | 2 | 2.90 |
| | 8.00 | 8.00 | 100.00 | .00 | .00 | 0 | 0 |
| | 2.90 | 2.90 | 100.00 | .00 | .00 | 0 | 0 |
| | 20.76 | 20.50 | 98.73 | .26 | - | - | - |
| | 5.00 | 4.93 | 98.67 | .07 | 2.50 | 2 | .42 |
| | 3.00 | 2.97 | 99.11 | .03 | 2.00 | 1 | .21 |
| | 1.01 | 1.00 | 98.68 | .01 | 1.00 | 1 | .21 |
| | 2.03 | 2.03 | 100.00 | .00 | .00 | 0 | 0 |
| | 2.08 | 2.08 | 100.00 | .00 | .00 | 0 | 0 |
| | 8.00 | 8.00 | 100.00 | .00 | .00 | 0 | 0 |
| | 21.12 | 21.01 | 99.50 | .11 | - | - | - |

Table 18 (Continued)

| School | Menu Items | Standard Portion Oz. | Average Portion Served Oz. | Food Cor Average Portion Oz. |
|---|---|---|---|---|
| 213 | Baked Beans | 4 | 5.19 | 5.18 |
| | Cole Slaw | 1.5 | 1.94 | 1.91 |
| | Peanut Butter and Margarine Sandwich | 1.5 | 2.61 | 2.61 |
| | Fruit Gelatin | 2 | 2.52 | 2.44 |
| | Milk | 8 | 8.05 | 8.03 |
| | Total | 17.0 | 20.31 | 20.17 |
| 221 | Beef and Noodles | 2.5 | 2.38 | 1.90 |
| | Buttered Peas | 1.5 | .88 | .49 |
| | Home Made Bread and Honey Butter | 1.5 | 1.69 | 1.62 |
| | Apple Crisp | 2 | 2.24 | 1.73 |
| | Milk | 8 | 8.58 | 8.22 |
| | Orange and Grapefruit Juice | 4 | 4.12 | 4.12 |
| | Total | 19.5 | 19.89 | 18.08 |
| 222 | Beans with Ham | 6 | 6.23 | 5.23 |
| | Corn Bread, Honey, Margarine | 3 | 6.26 | 5.66 |
| | Celery Sticks | .75 | .87 | .79 |
| | Fruit Gelatin | 3 | 2.92 | 2.62 |
| | Milk | 8 | 8.83 | 8.83 |
| | Orange Juice | 3 | 3.64 | 3.64 |
| | Total | 23.75 | 28.75 | 26.77 |
| 223 | Spaghetti and Tomatoes | 2 | 2.04 | 1.95 |
| | Cheese | 1 | 1.13 | 1.11 |
| | Buttered Green Beans | 4 | 4.18 | 3.85 |
| | Cabbage, Wedge | .67 | .68 | .67 |
| | Peanut Butter Sandwich | 2 | 2.83 | 2.66 |
| | Fruit Gelatin | 2 | 1.88 | 1.68 |
| | Milk | 8 | 8.23 | 7.32 |
| | Grapefruit Juice | 3 | 3.93 | 3.92 |
| | Total | 22.67 | 24.91 | 23.16 |

Table 18 (Continued)

| verage ortion erved Oz. | Food Consumed: Average Portion Oz. | Food Consumed: Per Cent | Food Returned: Per Person Served Oz. | Food Returned: Per Person Returning Food Oz. | Students Returning Food: No. | Students Returning Food: % |
|---|---|---|---|---|---|---|
| 5.19 | 5.18 | 99.93 | .003 | .50 | 1 | .74 |
| 1.94 | 1.91 | 98.28 | .03 | .90 | 5 | 3.70 |
| 2.61 | 2.61 | 100.00 | .00 | .00 | 0 | 0 |
| 2.52 | 2.44 | 99.06 | .08 | 2.00 | 5 | 3.70 |
| 8.05 | 8.03 | 99.63 | .03 | 1.00 | 4 | 2.96 |
| 20.31 | 20.17 | 99.31 | .14 | - | - | - |
| 2.38 | 1.90 | 79.81 | .48 | 2.02 | 26 | 23.85 |
| .88 | .49 | 55.73 | .39 | 1.33 | 32 | 29.36 |
| 1.69 | 1.62 | 96.06 | .07 | .48 | 15 | 13.76 |
| 2.24 | 1.73 | 77.15 | .51 | 2.23 | 25 | 22.93 |
| 8.58 | 8.22 | 95.83 | .36 | 1.50 | 26 | 23.85 |
| 4.12 | 4.12 | 100.00 | .00 | .00 | 0 | 0 |
| 19.89 | 18.08 | 90.91 | 1.81 | - | - | - |
| 6.23 | 5.23 | 83.85 | 1.00 | 5.54 | 14 | 18.18 |
| 6.26 | 5.66 | 90.40 | .60 | 2.89 | 16 | 20.78 |
| .87 | .79 | 90.30 | .08 | .41 | 16 | 20.78 |
| 2.92 | 2.62 | 89.67 | .30 | 2.33 | 10 | 12.99 |
| 8.83 | 8.83 | 100.00 | .00 | .00 | 0 | 0 |
| 3.64 | 3.64 | 100.00 | .00 | .00 | 0 | 0 |
| 28.75 | 26.77 | 93.22 | 1.98 | - | - | - |
| 2.04 | 1.95 | 95.49 | .09 | 1.00 | 13 | 9.22 |
| 1.13 | 1.11 | 97.81 | .02 | .88 | 4 | 2.84 |
| 4.18 | 3.85 | 91.72 | .34 | 2.58 | 19 | 13.47 |
| .68 | .67 | 97.92 | .01 | .67 | 3 | 2.13 |
| 2.83 | 2.66 | 93.87 | .17 | 1.44 | 17 | 12.06 |
| 1.88 | 1.68 | 89.78 | .19 | 1.50 | 18 | 12.76 |
| 8.23 | 7.32 | 88.97 | .91 | 5.81 | 22 | 15.60 |
| 3.93 | 3.92 | 100.00 | .00 | .00 | 0 | 0 |
| 24.91 | 23.16 | 92.97 | 1.75 | - | - | - |

Table 18 (Continued

| School | Menu Items | Standard Portion Oz. | Average Portion Served Oz. | Food Co Average Portion Oz. |
|---|---|---|---|---|
| 231 | Creamed Turkey | 2 ) | 4.46 | 4.02 |
| | Mashed Potatoes | 3 ) | | |
| | Cabbage and Carrot Salad | 2 | 2.42 | 2.01 |
| | Peanut Butter Sandwich | 1.5 | 2.83 | 2.78 |
| | Apple | 2 | 2.50 | 2.43 |
| | Milk | 8 | 9.17 | 8.72 |
| | Total | 18.5 | 21.37 | 19.95 |
| 232 | Baked Beans | 3 | 3.57 | 3.45 |
| | Cabbage and Carrot Salad | 1.5 | 1.71 | 1.64 |
| | Peanut Butter, Honey Sandwich | 2.5 | 2.85 | 2.84 |
| | Banana Custard | 2 | 2.38 | 2.37 |
| | Milk | 8 | 7.71 | 7.70 |
| | Orange Juice | 5 | 5.24 | 5.24 |
| | Total | 22.0 | 23.48 | 23.26 |
| 233 | Creamed Potatoes | 4 | 3.89 | 3.74 |
| | Spam | 1 | 1.29 | 1.28 |
| | Carrots, Raw | .5 | .538 | .535 |
| | Peanut Butter, Margarine Sandwich | 1.5 | 2.03 | 2.02 |
| | Pears, Canned | 2 | 2.64 | 2.59 |
| | Spice Cake | 2.5 | 2.80 | 2.78 |
| | Milk | 8 | 8.17 | 8.10 |
| | Orange and Grapefruit Juice | 5 | 5.60 | 5.60 |
| | Total | 24.5 | 26.95 | 26.65 |
| 234 | Navy Beans | 4 | 4.49 | 3.77 |
| | Hard Cooked Eggs | .5 ) | .53 | .48 |
| | Salad Dressing | .1 ) | | |
| | Cheese, Cheddar | 1 | .96 | .89 |
| | Carrots, Raw | 1 | 1.05 | 1.02 |
| | Peanut Butter Sandwich | 2 | 2.12 | 1.97 |
| | Apple Sauce | 3 | 3.34 | 3.27 |
| | Milk | 6 | 6.12 | 6.09 |
| | Orange Juice | 4 | 4.32 | 4.32 |
| | Total | 21.6 | 22.94 | 21.81 |

Table 18 (Continued)

| Average Portion Served | Food Consumed | | Food Returned | | Students Returning Food | |
|---|---|---|---|---|---|---|
| | Average Portion | Per Cent | Per Person Served | Per Person Returning Food | | |
| Oz. | Oz. | | Oz. | Oz. | No. | % |
| 4.46 | 4.02 | 90.19 | .44 | 1.83 | 23 | 23.96 |
| 2.42 | 2.01 | 82.97 | .41 | 1.72 | 23 | 23.96 |
| 2.83 | 2.78 | 98.07 | .05 | .40 | 13 | 13.54 |
| 2.50 | 2.43 | 97.29 | .07 | 1.63 | 4 | 4.17 |
| 9.17 | 8.72 | 95.09 | .45 | 4.81 | 9 | 9.37 |
| 21.37 | 19.95 | 93.35 | 1.42 | - | - | - |
| 3.57 | 3.45 | 96.67 | .12 | 1.25 | 8 | 9.52 |
| 1.71 | 1.64 | 95.83 | .07 | .75 | 8 | 9.52 |
| 2.85 | 2.84 | 99.58 | .01 | .33 | 3 | 3.57 |
| 2.38 | 2.37 | 99.75 | .01 | .50 | 1 | 1.19 |
| 7.71 | 7.70 | 99.85 | .01 | 1.00 | 1 | 1.19 |
| 5.24 | 5.24 | 100.00 | .00 | .00 | 0 | 0 |
| 23.48 | 23.26 | 99.06 | .22 | - | - | - |
| 3.89 | 3.74 | 96.13 | .15 | 2.42 | 12 | 6.22 |
| 1.29 | 1.28 | 99.20 | .01 | 1.00 | 2 | 1.04 |
| .538 | .535 | 99.28 | .003 | .38 | 2 | 1.04 |
| 2.03 | 2.02 | 99.55 | .01 | .44 | 4 | 2.07 |
| 2.64 | 2.59 | 98.14 | .05 | 1.90 | 5 | 2.59 |
| 2.80 | 2.78 | 99.40 | .02 | 1.08 | 3 | 1.55 |
| 8.17 | 8.10 | 99.21 | .07 | 2.08 | 6 | 3.11 |
| 5.60 | 5.60 | 100.00 | .00 | .00 | 0 | 0 |
| 26.95 | 26.65 | 98.87 | .30 | - | - | - |
| 4.49 | 3.77 | 84.00 | .72 | 3.11 | 58 | 23.11 |
| .53 | .48 | 91.29 | .05 | .77 | 15 | 5.98 |
| .96 | .89 | 93.12 | .07 | .69 | 24 | 9.56 |
| 1.05 | 1.02 | 96.78 | .03 | .53 | 16 | 6.37 |
| 2.12 | 1.97 | 92.70 | .15 | 1.39 | 28 | 11.16 |
| 3.34 | 3.27 | 97.80 | .07 | 2.31 | 8 | 3.19 |
| 6.12 | 6.09 | 99.48 | .03 | 8.00 | 1 | .40 |
| 4.32 | 4.32 | 100.00 | .00 | .00 | 0 | 0 |
| 22.94 | 21.81 | 95.09 | 1.13 | - | - | - |

Table 18 (Continued)

| School | Menu Items | Standard Portion Oz. | Average Portion Served Oz. | Food Con Average Portion Oz. |
|---|---|---|---|---|
| 235 | Baked Beef Hash | 5 | 4.92 | 4.42 |
| | Breaded Tomatoes | 1.5 | 1.78 | 1.44 |
| | Carrot Sticks | 1 | .98 | .96 |
| | Peanut Butter Sandwich | 1.25 | 1.85 | 1.78 |
| | Chocolate Pudding | 2.5 | 2.63 | 2.54 |
| | Milk | 8 | 7.38 | 7.02 |
| | Orange and Grapefruit Juice | 2 | 2.63 | 2.63 |
| | Total | 21.25 | 22.17 | 20.79 |
| 236 | Cheese | 1 | 1.00 | .93 |
| | Creamed Potatoes | 3.67 | 8.65 | 7.75 |
| | Gelatin Vegetable Salad | 2.67 | 2.93 | 2.74 |
| | Bread and Butter | 1 | 2.07 | 1.99 |
| | Ginger Bread | 1 | .89 | .81 |
| | Milk | 8 | 7.11 | 6.94 |
| | Total | 17.34 | 22.65 | 21.16 |
| 237 | Macaroni and Cheese | 4 | 4.72 | 4.36 |
| | Harvard Beets | 2 | 2.34 | 2.23 |
| | Peanut Butter and Fruit Sandwich | 1.5 | 3.66 | 3.26 |
| | Plums, Canned | 2.5 | 2.82 | 2.74 |
| | Frosted Graham Cracker | 1 | 1.44 | 1.43 |
| | Milk | 8 | 6.43 | 6.41 |
| | Orange Juice | 3 | 3.59 | 3.52 |
| | Total | 22.0 | 25.00 | 23.95 |
| 238 | Creamed Chicken | 2.5 ) | 8.86 | 8.61 |
| | Mashed Potatoes | 4 ) | | |
| | Lima Beans | 2 | 1.81 | 1.71 |
| | Parkerhouse Rolls | 1 ) | 1.66 | 1.62 |
| | Margarine | .25 ) | | |
| | Apple Crisp | 4 | 3.81 | 3.71 |
| | Milk | 8 | 7.53 | 7.38 |
| | Orange Juice | 2 | 2.17 | 2.17 |
| | Total | 23.75 | 25.84 | 25.20 |
| 239 | No Data Obtained | | | |

Table 18 (Continued)

| Average Portion Served Oz. | Food Consumed: Average Portion Oz. | Food Consumed: Per Cent | Food Returned: Per Person Served Oz. | Food Returned: Per Person Returning Food Oz. | Students Returning Food: No. | Students Returning Food: % |
|---|---|---|---|---|---|---|
| 4.92 | 4.42 | 89.79 | .50 | 1.81 | 54 | 27.69 |
| 1.78 | 1.44 | 80.89 | .34 | .86 | 77 | 39.49 |
| .98 | .96 | 96.78 | .02 | .35 | 15 | 7.69 |
| 1.85 | 1.78 | 96.39 | .07 | 1.62 | 8 | 4.10 |
| 2.63 | 2.54 | 96.63 | .09 | 1.57 | 11 | 5.64 |
| 7.38 | 7.02 | 95.10 | .36 | 3.53 | 20 | 10.26 |
| 2.63 | 2.63 | 100.00 | .00 | .00 | 0 | 0 |
| 22.17 | 20.79 | 93.74 | 1.38 | - | - | - |
| 1.00 | .93 | 93.01 | .07 | .68 | 14 | 10.37 |
| 8.65 | 7.75 | 89.60 | .90 | 3.92 | 31 | 22.96 |
| 2.93 | 2.74 | 93.37 | .19 | 1.94 | 13 | 9.63 |
| 2.07 | 1.99 | 95.89 | .08 | .72 | 16 | 11.85 |
| .89 | .81 | 91.25 | .08 | 1.25 | 8 | 5.93 |
| 7.11 | 6.94 | 97.58 | .17 | 5.81 | 4 | 2.96 |
| 22.65 | 21.16 | 93.38 | 1.49 | - | - | - |
| 4.72 | 4.36 | 92.48 | .36 | 1.89 | 22 | 18.80 |
| 2.34 | 2.23 | 95.07 | .11 | .67 | 20 | 17.09 |
| 3.66 | 3.26 | 89.14 | .40 | 1.26 | 37 | 31.62 |
| 2.82 | 2.74 | 97.20 | .08 | 1.03 | 9 | 7.69 |
| 1.44 | 1.43 | 99.70 | .01 | .75 | 2 | 1.71 |
| 6.43 | 6.41 | 99.66 | .02 | .50 | 10 | 4.27 |
| 3.59 | 3.52 | 98.10 | .07 | 2.00 | 4 | 3.42 |
| 25.00 | 23.95 | 95.84 | 1.05 | - | - | - |
| 8.86 | 8.61 | 97.19 | .25 | 6.17 | 9 | .40 |
| 1.81 | 1.71 | 94.43 | .10 | 1.12 | 20 | 8.97 |
| 1.66 | 1.62 | 97.77 | .04 | 1.03 | 8 | 3.59 |
| 3.81 | 3.71 | 97.26 | .10 | 2.58 | 9 | 4.03 |
| 7.53 | 7.38 | 98.01 | .15 | 3.35 | 10 | 4.48 |
| 2.17 | 2.17 | 100.00 | .00 | .00 | 0 | 0 |
| 25.84 | 25.20 | 97.52 | .64 | - | - | - |

Table 18 (Contir

| School | Menu Items | Standard Portion Oz. | Average Portion Served Oz. | Food Average Portion Oz. |
|---|---|---|---|---|
| 2310 | Meat Loaf | 3 | 1.78 | 1.60 |
| | Creamed Peas | 2 | 2.31 | 1.98 |
| | Carrot Sticks | .25 | .18 | .11 |
| | Bread, Home Made | 1 ) | 1.68 | 1.51 |
| | Margarine | .25) | | |
| | Peaches, canned | 2 | 2.52 | 2.46 |
| | Chocolate Ice Box Cooky | .5 | .43 | .41 |
| | Milk, Raw, Bulk | 6 | 5.91 | 5.67 |
| | Orange and Grapefruit Juice | 3 | 3.18 | 3.18 |
| | Total | 18.00 | 17.99 | 16.92 |
| 2311 | Creole Spaghetti | 3 | 3.19 | 2.90 |
| | Cole Slaw | 2.5 | 2.20 | 1.98 |
| | Bread and Butter Sandwich | 1.125 | 1.63 | 1.56 |
| | Apple Sauce Cake with Icing | 3 | 4.14 | 3.97 |
| | Milk | 8 | 8.47 | 8.11 |
| | Orange and Grapefruit Juice | 2 | 1.83 | 1.80 |
| | Total | 19.625 | 21.46 | 20.32 |
| 2312 | Noodles ) | | | |
| | Beef ) | 9 | 8.86 | 6.88 |
| | Mashed Potatoes ) | | | |
| | Cabbage Salad | 2 | 2.03 | 1.58 |
| | Bread and Butter Sandwich | 1.25 | 2.01 | 1.80 |
| | Fruit Gelatin | 2.5 | 3.18 | 3.15 |
| | Milk | 8 | 8.20 | 7.56 |
| | Total | 22.75 | 24.28 | 20.97 |
| 2313 | Cheese | 1 | .92 | .62 |
| | Baked Potatoes ) | | | |
| | Margarine ) | 3.5 | 2.91 | 2.51 |
| | Green Beans | 3 | 3.38 | 3.08 |
| | Bread and Margarine | 1 | 1.69 | 1.57 |
| | Peaches, canned | 3 | 2.94 | 2.94 |
| | Peanut Butter Cooky | .75 | .91 | .90 |
| | Milk | 8 | 6.93 | 6.42 |
| | Orange Juice | 3 | 1.29 | 1.29 |
| | Total | 23.25 | 21.02 | 19.33 |

Table 18 (Continued)

| verage ortion erved Oz. | Food Consumed: Average Portion Oz. | Food Consumed: Per Cent | Food Returned: Per Person Served Oz. | Food Returned: Per Person Returning Food Oz. | Students Returning Food: No. | Students Returning Food: % |
|---|---|---|---|---|---|---|
| 1.78 | 1.60 | 89.44 | .18 | 1.29 | 19 | 14.61 |
| 2.31 | 1.98 | 85.83 | .33 | 1.37 | 31 | 23.85 |
| .18 | .11 | 61.46 | .07 | 1.54 | 6 | 4.61 |
| 1.68 | 1.51 | 90.14 | .17 | 1.13 | 19 | 14.61 |
| 2.52 | 2.46 | 97.71 | .06 | 2.50 | 3 | 2.31 |
| .43 | .41 | 96.43 | .02 | .40 | 5 | 3.85 |
| 5.91 | 5.67 | 96.00 | .24 | 4.39 | 7 | 5.38 |
| 3.18 | 3.18 | 100.00 | .00 | .00 | 0 | 0 |
| 17.99 | 16.92 | 94.10 | 1.07 | - | - | - |
| 3.19 | 2.90 | 90.65 | .29 | 1.76 | 20 | 16.81 |
| 2.20 | 1.98 | 89.81 | .22 | 1.06 | 25 | 21.01 |
| 1.63 | 1.56 | 89.67 | .07 | .60 | 14 | 11.76 |
| 4.14 | 3.97 | 95.90 | .17 | 1.67 | 12 | 10.08 |
| 8.47 | 8.11 | 95.75 | .36 | 3.27 | 13 | 2.52 |
| 1.83 | 1.80 | 98.15 | .03 | 1.33 | 3 | 10.92 |
| 21.46 | 20.32 | 94.60 | 1.14 | - | - | - |
| 8.86 | 6.88 | 77.68 | 1.98 | 4.59 | 84 | 43.08 |
| 2.03 | 1.58 | 77.97 | .45 | 1.65 | 53 | 27.18 |
| 2.01 | 1.80 | 89.67 | .21 | 1.09 | 37 | 18.97 |
| 3.18 | 3.15 | 98.95 | .03 | .65 | 10 | 5.13 |
| 8.20 | 7.56 | 92.16 | .64 | 4.04 | 31 | 15.90 |
| 24.28 | 20.97 | 86.37 | 3.31 | - | - | - |
| .92 | .62 | 67.19 | .30 | 1.81 | 29 | 16.76 |
| 2.91 | 2.51 | 86.26 | .40 | 2.39 | 29 | 16.76 |
| 3.38 | 3.08 | 91.04 | .30 | 2.63 | 20 | 11.56 |
| 1.69 | 1.57 | 93.07 | .12 | 1.13 | 18 | 10.40 |
| 2.94 | 2.94 | 98.36 | .05 | 1.70 | 5 | 2.89 |
| .91 | .90 | 99.04 | .01 | .30 | 5 | 2.89 |
| 6.93 | 6.42 | 92.58 | .51 | 3.87 | 23 | 13.29 |
| 1.29 | 1.29 | 100.00 | .00 | .00 | 0 | 0 |
| 21.02 | 19.33 | 91.94 | 1.69 | - | - | - |

Table 19. Amount, Cost and Nutritive Content of Menu

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Pro G |
|---|---|---|---|---|---|
| School 230 (May 4) | | | | | |
| Creamed Potatoes | | | | | |
| Potatoes, A.P. | 100 | $ - | $ 3.20 | 31,800 | 7 |
| Milk | 32 | 2.275 | - | 9,888 | 5 |
| Flour, enriched | 2.286 | .185 | - | 3,781 | 1 |
| Butter | 1.25 | 1.025 | - | 4,064 | |
| Lard | 2.4 | .864 | - | 9,828 | |
| Salt | 1 | .064 | - | - | |
| Total | 93.5 | 4.410 | 3.20 | 59,361 | 1,3 |
| Portion, 4 oz. | | .012 | .009 | 158.72 | |
| Ground Meat Sandwich | | | | | |
| Minced Ham | 9 | 4.950 | - | 11,790 | 6 |
| Bread, enriched | 25 | 2.800 | - | 31,175 | 9 |
| Butter | 1 | .820 | - | 3,251 | |
| Cream, 18% | 1 | .600 | - | 925 | |
| Salad Dressing | 7.5 | .255 | .62 | 3,990 | 1 |
| Total | 32.5 | 9.430 | .62 | 51,131 | 1,7 |
| Portion, 2 oz. | | .036 | .002 | 196 | |
| Cabbage Salad | | | | | |
| Cabbage | 27 | 2.43 | - | 2,160 | 1 |
| Salad Dressing | 3 | 1.035 | - | 5,229 | |
| Sugar | 2 | .174 | - | 3,496 | |
| Total | 18.5 | 3.640 | - | 10,885 | 1 |
| Portion, 1.5 oz. | | .018 | - | 56.69 | |

nu Items Prepared in 26 Iowa Schools on the Day Observed

| Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| 760 | 4,200 | 270 | 7,000 | 40 | 15 | 440 | 6,400 |
| 508.8 | 17,152 | 9.6 | (23,040) | 5.12 | 24.96 | 16 | 192 |
| 109 | 166.9 | 29.7 | (0) | 4.57 | 2.74 | 36.60 | (0) |
| 3.4 | 113.8 | 0 | 18,750 | .01 | .06 | .63 | (0) |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | - | - | - | - |
| 1,381.2 | 21,632.7 | 309.3 | 48,790 | 49.70 | 42.76 | 493.23 | 6,592 |
| 3.68 | 57.84 | .84 | 130.44 | .12 | .12 | 1.32 | 17.64 |
| 608.4 | 369. | 90 | (0) | 12.96 | 9. | 112.50 | 0 |
| 965 | 8,975 | 200 | 0 | 27.50 | 17.50 | 250 | 0 |
| 2.7 | 91 | 0 | 15,000 | .01 | .05 | .50 | 0 |
| 13.2 | 440 | .3 | 3,750 | .14 | .64 | .40 | 5 |
| 122.3 | 472.5 | 24.3 | 8,838 | 1.28 | 2.78 | 4.43 | 0 |
| ,711.6 | 10,347.5 | 314.6 | 27,588 | 41.89 | 29.97 | 367.83 | 5 |
| 6.58 | 39.78 | 1.22 | 106.10 | .16 | .12 | 1.42 | .002 |
| 124.2 | 4,104 | 45.9 | 7,290 | 5.40 | 4.59 | 27 | 4,455 |
| 15 | 123 | 5.4 | 1,980 | .21 | .42 | (0) | 0 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 139.2 | 4,227 | 51.3 | 927 | 5.61 | 5.01 | 27 | 4,455 |
| .72 | 22.02 | .27 | 48.29 | .028 | .03 | .141 | 23.21 |

Table 19 (Conti

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Prot Gm |
|---|---|---|---|---|---|
| Spice Cooky | | | | | |
| Walnut Meats | 1.875 | $ - | $1.444 | 5,573 | 1 |
| Sugar | 3 | .261 | - | 5,244 | |
| Shortening, vegetable | 1.5 | .540 | - | 6,020 | |
| Eggs, dried | .3 | - | .420 | 840 | |
| Milk, sour | 3 | .244 | - | 927 | |
| Soda | .875 | .005 | - | - | |
| Flour | 3.428 | .278 | - | 5,670 | 1 |
| Cinnamon | .03 | .027 | - | - | |
| Nutmeg | .571 | .028 | - | - | |
| Cloves | .286 | .014 | - | - | |
| Raisins | 2 | - | .224 | 2,436 | |
| Total | 13.5 | 1.400 | 2.090 | 6,710 | 4 |
| Portion, 1 oz. | | .006 | .010 | 123.66 | |
| Milk | | | | | |
| Portion, 8 oz. | | .05 | - | 155 | |
| Orange Juice | | | | | |
| Sugar | 2.8 | .25 | - | 4,894 | |
| Orange Juice, canned concentrate | 7.625 | - | 3.05 | 7,922 | 1 |
| Total | 56 | .25 | 3.05 | 12,816 | 1 |
| Portion, 4 oz. | | .001 | .013 | 57.20 | |
| Salad Dressing | | | | | |
| Eggs, dried | .6 | - | .84 | 1,681 | 1 |
| Salt | .125 | .008 | - | - | |
| Mustard | .05 | .054 | - | - | |
| Paprika | .003 | .003 | - | - | |
| Sugar | 1.5 | .130 | - | 2,622 | |
| Vinegar | .125 | .088 | - | 11 | |
| Flour, enriched | .286 | .023 | - | 473 | |
| Total | 9 | .306 | .84 | 4,787 | 1 |
| Used | 7.5 | .255 | .62 | 3,990 | 1 |

) (Continued)

| Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| 127.7 | 706.9 | 17.8 | 300 | 4.07 | 1.13 | 10.13 | 24.38 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 66.4 | 269.7 | 12.5 | 5,303. | .48 | 1.49 | .35 | 0 |
| 47.7 | 1,608 | .9 | 2,160 | .48 | 2.34 | 1.50 | 18 |
| - | - | - | - | - | - | - | - |
| 163.5 | 250.2 | 44.6 | (0) | 6.86 | 4.11 | 54.85 | (0) |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 20.8 | 708. | 30 | 460 | 1.38 | .74 | 4.40 | Tr. |
| 426.1 | 3,542.8 | 105.8 | 8,223 | 13.27 | 9.81 | 71.23 | 42.38 |
| 1.97 | 16.40 | .49 | 38.07 | .06 | .05 | .33 | .20 |
| 7.9 | 268 | .15 | (360) | .08 | .39 | .25 | 3.0 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 145.6 | 2,112.1 | 55.66 | 17,690 | 12.81 | 2.90 | 39.65 | 7,647.9 |
| 145.6 | 2,112.1 | 55.66 | 17,690 | 12.81 | 2.90 | 39.65 | 7,647.9 |
| .64 | 9.44 | .24 | 78.96 | .056 | .012 | .12 | 34.16 |
| 132.8 | 539.4 | 25 | 10,606 | .95 | 2.99 | .69 | |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| - | 6.0 | .43 | (0) | - | - | - | - |
| 13.6 | 20.9 | 3.72 | (0) | .57 | .34 | 4.58 | (0) |
| 146.4 | 566.3 | 29.15 | 10,606 | 1.52 | 3.33 | 5.27 | 0 |
| 122.3 | 472.5 | 24.3 | 8,838 | 1.28 | 2.78 | 4.43 | 0 |

Table 19 (Continu

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protei Gm. |
|---|---|---|---|---|---|
| School 230 (May 5) | | | | | |
| Hamburger Gravy | | | | | |
| Beef, ground | 15 | $7.80 | $ - | 15,285 | 1,266 |
| Flour | 2.428 | .197 | - | 4,016 | 115. |
| Milk | 4.4 | 3.575 | - | 13,596 | 699. |
| Lard | 1 | .21 | - | 4,095 | 0 |
| Total | 43 | 11.78 | - | 36,992 | 2,081. |
| Portion, 2 oz. | | .034 | - | 107.54 | 6. |
| Baking Powder Biscuits | | | | | |
| Lard | 4 | 1.08 | - | 16,380 | - |
| Flour | 14.286 | 1.157 | - | 23,629 | 681. |
| Salt | .33 | .017 | - | - | - |
| Baking Powder | .85 | .125 | - | - | - |
| Milk | 12 | .975 | - | 3,708 | 190 |
| Total | 42.5 | 3.35 | - | 43,717 | 872 |
| Portion, 2 oz. | | .010 | - | 128.58 | 2 |
| Sandwich | | | | | |
| Bread, enriched | 14.5 | 1.82 | - | 18,082 | 559 |
| Butter | 2 | 1.64 | - | 6,502 | 5 |
| Total | 14.5 | 3.46 | - | 24,584 | 565 |
| Portion, 1 oz. | | .015 | - | 105.96 | 2 |
| Green Beans | | | | | |
| Green Beans, canned | 36 | 5.19 | - | 2,988 | 162 |
| Butter | 1 | .82 | - | 3,251 | 2 |
| Total | 31 | 6.01 | - | 6,239 | 164 |
| Portion, 2 oz. | | .025 | - | 25.2 | |
| Apples | | | | | |
| Apples, A.P. | 47.5 | - | 3.52 | | |
| Portion, 3 oz. | | - | .018 | 43.50 | |
| Milk | | | | | |
| Portion, 8 oz. | | .05 | - | 155 | 7 |

19 (Continued)

| | Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|---|
| | 1,266 | 750 | 190.50 | (0) | 5.40 | 11.25 | 303 | 0 |
| | 115.8 | 177.2 | 31.56 | (0) | 4.86 | 2.91 | 38.85 | (0) |
| | 699.6 | 23,584 | 13.2 | 31,680 | 7.04 | 34.32 | 22 | 264 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2,081.4 | 24,511.2 | 235.26 | 31,680 | 17.30 | 48.48 | 363.85 | 264 |
| 54 | 6.06 | 71.26 | .68 | 92 | .06 | .14 | 1.06 | .76 |
| | - | - | - | - | - | - | - | - |
| | 681.4 | 1,042.8 | 185.72 | (0) | 28.57 | 17.14 | 228.58 | (0) |
| | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - |
| | 190.8 | 6,432 | 3.60 | 8,640 | 1.92 | 9.36 | 6.00 | 72 |
| | 872.2 | 7,474.8 | 189.32 | 8,640 | 30.49 | 26.50 | 234.58 | 72 |
| 58 | 2.56 | 21.98 | .56 | 25.42 | .10 | .08 | .68 | .22 |
| | 559.7 | 5,205.5 | 116 | 0 | 15.95 | 10.15 | 145 | 0 |
| | 5.4 | 182 | 0 | 30,000 | .02 | .10 | 1 | 0 |
| | 565.1 | 5,387.5 | 116 | 30,000 | 15.97 | 10.25 | 146 | 0 |
| 96 | 2.44 | 23.22 | .50 | 129.32 | .07 | .04 | .63 | 0 |
| | 162 | 4,428 | 230.40 | 67,680 | 5.40 | 6.84 | 46.80 | 648 |
| | 2.7 | 91 | 0 | 15,000 | .01 | .05 | .50 | 0 |
| | 164.7 | 4,519 | 230.40 | 82,680 | 5.41 | 6.89 | 47.30 | 648 |
| 2 | .66 | 18.22 | .92 | 333.40 | .02 | .02 | .18 | 2.62 |
| 50 | .23 | 4.5 | .23 | 67.5 | .03 | .02 | .13 | 3.4 |
| | 7.9 | 268 | .15 | (360) | .08 | .39 | .25 | 3. |

Table 19 (Continu

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. | Calciu Mg. |
|---|---|---|---|---|---|---|
| Orange Juice | | | | | | |
| Orange Juice, canned concentrate | 7.625 | $ - | $ 3.05 | 7,922 | 145.6 | 2,112 |
| Sugar | 2.8 | .25 | - | 4,894 | (0) | - |
| Total | 56 | .25 | 3.05 | 12,816 | 145.6 | 2,112 |
| Portion, 4 oz. | | .001 | .013 | 57.2 | .64 | 9 |
| School 230 (May 6) | | | | | | |
| Scalloped Potatoes with Ham | | | | | | |
| Ham, boneless | 18 | 12.29 | - | 31,806 | 1,380.6 | 810 |
| Potatoes, A.P. | 85 | 3.06 | - | 27,030 | 646 | 3,570 |
| Milk | 48 | 3.90 | - | 14,832 | 763.2 | 25,728 |
| Flour | 3.428 | .278 | - | 5,670 | 163.5 | 250 |
| Lard | 1 | .250 | - | 4,095 | -0 | ( |
| Fat, hydrogenated | .8 | .288 | - | 3,210 | 0 | ( |
| Salt | .75 | .048 | - | | | |
| Total | 92.25 | 20.11 | - | 86,643 | 2,953.3 | 30,358 |
| Portion, 6 oz. | | .082 | - | 352.20 | 12 | 123 |
| Fruit Salad | | | | | | |
| Apples, A.P. | 17 | - | 1.776 | 3,944 | 20.4 | 408 |
| Fruit Cocktail | 25 | 5.16 | - | 7,925 | 45 | 1,025 |
| Pineapple, canned | 5 | 1.20 | - | 1,775 | 9 | 660 |
| Marshmallows | .75 | .336 | - | 1,108 | 10.2 | (( |
| Total | 37.75 | 6.70 | 1.78 | 14,752 | 84.6 | 2,093 |
| Portion, 3 oz. | | .034 | .009 | 72.39 | .42 | 10 |
| Sandwiches | | | | | | |
| Bread, wh. enr. | 21.25 | 2.38 | - | 26,499 | 820.3 | 7,628 |
| Butter | 3 | 2.46 | - | 9,753 | 8.1 | 273 |
| Total | 18 | 4.84 | - | 36,252 | 828.4 | 7,903 |
| Portion, 1 oz. | | .017 | - | 119.25 | 2.73 | 25 |
| Milk | | | | | | |
| Portion, 8 oz. | | .05 | - | 155 | 7.9 | 268 |

Table 19 (Continued)

| Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| 145.6 | 2,112.1 | 55.66 | 17,690 | 12.81 | 2.90 | 39.65 | 7,647.9 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 145.6 | 2,112.1 | 55.66 | 17,690 | 12.81 | 2.90 | 39.65 | 7,647.9 |
| .64 | 9.44 | .24 | 78.96 | .056 | .012 | .16 | 34.16 |
| 1,380.6 | 810 | 205.20 | (0) | 57.06 | 15.30 | 322.20 | (0) |
| 646 | 3,570 | 229.50 | 5,950 | 34 | 12.75 | 374 | 5,440 |
| 763.2 | 25,728 | 14.40 | 34,560 | 7.68 | 37.44 | 24. | 288 |
| 163.5 | 250.2 | 44.56 | (0) | 6.86 | 4.11 | 54.85 | 0 |
| -0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2,953.3 | 30,358.2 | 493.67 | 40,510 | 105.60 | 69.60 | 775.05 | 5,728 |
| 12 | 123.42 | 1.98 | 168.64 | .42 | .30 | 3.18 | 23.28 |
| 20.4 | 408 | 20.4 | 6,120 | 2.72 | 2.04 | 11.9 | 306 |
| 45 | 1,025 | 45 | 18,250 | 1.25 | 1.25 | 40 | 225 |
| 9 | 660 | 13.5 | 1,800 | 1.75 | .35 | 4.0 | 205 |
| 10.2 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 84.6 | 2,093 | 78.9 | 26,170 | 5.72 | 3.64 | 55.9 | 736 |
| .42 | 10.41 | .39 | 129.99 | .027 | .018 | .27 | 3.66 |
| 820.3 | 7,628.8 | 170 | 0 | 23.38 | 14.88 | 212.50 | 0 |
| 8.1 | 273 | - | 45,000 | .03 | .15 | 1.50 | 0 |
| 828.4 | 7,901.8 | 170 | 45,000 | 23.41 | 15.03 | 214 | 0 |
| 2.73 | 25.99 | .56 | 148.03 | .077 | .05 | .70 | 0 |
| 7.9 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |

Table 19 (Contin

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Orange Juice | | | | | |
| Orange Juice, canned, concentrate | 7.25 | $ - | $ 2.73 | 7,533 | 138.5 |
| Sugar | 2.5 | .225 | - | 4,370 | (0) |
| Total | 50 | .225 | 2.73 | 11,903 | 138.5 |
| Portion, 4 oz. | | .001 | .001 | 59.52 | .68 |
| School 110 | | | | | |
| Baked Hash | | | | | |
| Beef, chuck | 40 | 24 | - | 40,760 | 3,376 |
| Onions, A.P. | 7 | .14 | - | 588 | 133 |
| Potatoes, A.P. | 90 | 2.48 | - | 28,620 | 684 |
| B.V.[a] | .4 | .54 | - | ? | ? |
| Broth (from meat) | - | .00 | - | - | - |
| Water | - | .00 | - | - | - |
| Total | 105 | 27.16 | - | 69,968 | 4,193 |
| Portion, 4 oz. | | .065 | | 166.60 | 10 |
| Baked Tomatoes with Bread | | | | | |
| Tomatoes, canned | 40 | 4.80 | - | 3,440 | 180 |
| Bread, enriched | 1 | .24 | - | 1,247 | 38.6 |
| Butter | 1 | .71 | - | 3,251 | 2.7 |
| Total (448 oz.) | 28 | 5.75 | - | 7,938 | 221.3 |
| Portion, 3.5 oz. | | .045 | - | 62 | 1.71 |
| Apple, Grape and Celery Salad | | | | | |
| Celery, A.P. | 5.6 | .85 | - | 291.2 | 20.72 |
| Apples, A.P. | 25 | 1.30 | - | 5,800 | 30 |
| Lemons | 1 | .26 | - | 88 | 2.5 |
| Grapes | 3 | .51 | - | 796 | 10.50 |
| Salad Dressing | 4 | 1.50 | - | 6,972 | 20 |
| Total | 31 | 3.42 | - | 13,947.2 | 83.72 |
| Portion, 2 oz. | | .014 | - | 56.2 | .34 |

[a]Figures for nutritive content of B.V. obtained from Research and Technical Divisio

19 (Continued)

| Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|
| Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 138.5 | 2,008.3 | 52.93 | (16,820) | 12.18 | 2.76 | 37.7 | 7,271.8 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 138.5 | 2,008.3 | 52.93 | 16,820 | 12.18 | 2.76 | 37.7 | 7,271.8 |
| .68 | 10.04 | .264 | 84.12 | .060 | .012 | .188 | 36.36 |
| 3,376 | 2,000 | 508 | (0) | 14.40 | 30 | 808 | 0 |
| 133 | 1,757 | 11.9 | (630) | (.42) | (.49) | (2.8) | 308 |
| 684 | 3,780 | 243 | 6,300 | 36 | 13.50 | 396 | 5,760 |
| ? | ? | 5.7 | 0 | .04 | 4.24 | 73.92 | 0 |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 4,193 | 7,537 | 768.6 | 6,930 | 50.86 | 48.23 | 1,280.7 | 6,068 |
| 10 | 17.96 | 1.84 | 16.52 | .12 | .12 | 3.04 | 14.44 |
| 180 | (2,000) | (108) | 190,800 | 10 | 6 | 128 | 3,000 |
| 38.6 | 359 | 8 | - | 1.10 | .70 | 10 | 0 |
| 2.7 | 91 | 0 | 15,000 | .01 | .05 | .5 | 0 |
| 221.3 | 2,450 | 116 | 205,800 | 11.11 | 6.75 | 138.5 | 3,000 |
| 1.71 | 19.14 | .91 | 1,607 | .07 | .07 | 1.08 | 23.4 |
| 20.72 | 800.8 | 7.84 | 0 | 2.84 | .62 | 6.72 | 112 |
| 30 | 600 | 30 | 9,000 | 4 | 3 | 17.5 | 450 |
| 2.5 | 112 | 1.7 | 0 | .13 | .01 | .4 | 139 |
| 10.50 | 225 | 7.8 | 990 | .780 | .51 | 3 | 51 |
| 20 | 164 | 7.2 | 2,640 | .28 | .56 | (0) | (0) |
| 83.72 | 1,901.8 | 54.54 | 12,630 | 6.03 | 4.70 | 27.62 | 752 |
| .34 | 7.6 | .22 | 51. | .02 | .02 | .12 | 3 |

al Division of Wilson & Co., Chicago, Illinois.

Table 19 (Continu

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Milk | | | | | |
| Portion, 8 oz. | | $ .0475 | $ - | .155 | 7.91 |
| School 111 | | | | | |
| Beef Burger | | | | | |
| Beef, ground, chuck | 30 | 14.10 | - | 30,570 | 2,532 |
| Onions, A.P. | 3 | .08 | - | 579 | 18 |
| Total | 29.5 | 14.18 | - | 31,149 | 2,550 |
| Portion, 2 oz. | | .061 | - | 134.56 | 11.02 |
| Buns, enriched | | | | | |
| Portion, 2 oz. | | .033 | - | 175.75 | 5.1 |
| Butter | | | | | |
| Portion, .25 oz. | | .010 | - | 50.80 | .042 |
| Mashed Potatoes | | | | | |
| Potatoes, A.P. | 39 | - | 1.45 | 12,402 | 296.4 |
| Milk, dried, non fat | 1 | - | .14 | 1,643 | 161.6 |
| Total | 39 | - | 1.59 | 14,045 | 458 |
| Portion, 3 oz. | | - | .008 | 67.53 | 2.19 |
| Gravy | | | | | |
| Flour, enriched | .75 | .05 | - | 1,240.5 | 35.77 |
| Broth, from meat | 24 | - | - | - | - |
| Kitchen Bouquet | .125 | .16 | - | - | - |
| Total | 37.5 | .21 | - | 1,240.5 | 35.77 |
| Portion, 3 oz. | | .001 | - | 6.21 | .177 |
| Cranberry Salad | | | | | |
| Gelatin Dessert Powder | 4.0625 | 1.38 | - | 7,007.8 | 173.469 |
| Cranberry Sauce | 7 | 1.86 | - | 6,300.7 | 3.500 |
| Lemon Juice | .25 | .11 | - | 27 | .450 |
| Celery, A.P. | 4 | .48 | - | 208 | 14.8 |
| Walnut Meats | 2 | - | 1.64 | 5,944 | 136.200 |
| Total | 28.25 | 3.83 | 1.64 | 17,486.8 | 328.419 |
| Portion, 2 oz. | | .017 | .007 | 86.22 | 1.46 |

e 19 (Continued)

| Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|
| Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 7.91 | 268 | .15 | (360) | .08 | .39 | .25 | 3.0 |
| 2,532 | 1,500 | 381 | (0) | 10.80 | 22.50 | 606 | 0 |
| 18 | 411 | 6.3 | 630 | .42 | .45 | .27 | 114 |
| 2,550 | 1,911 | 387.3 | 630 | 11.22 | 22.95 | 606.27 | 114 |
| 11.02 | 8.26 | 1.68 | 2.72 | .048 | .10 | 2.62 | .50 |
| 5.1 | 31.2 | 1 | 0 | .14 | .0875 | 1.25 | (0) |
| .0421 | 1.42 | 0 | 235 | Tr. | Tr. | .01 | (0) |
| 296.4 | 1,638 | 105.3 | 2,730 | 15.6 | 5.85 | 171.6 | 2,496 |
| 161.6 | 5,902 | 2.6 | (190) | 1.60 | 8.88 | 5.2 | 32 |
| 458 | 7,540 | 107.9 | 2,920 | 17.20 | 14.73 | 176.8 | 2,528 |
| 2.19 | 36.24 | .51 | 14.04 | .09 | .06 | .84 | 12.15 |
| 35.77 | 54.75 | 9.75 | (0) | 1.5 | .9 | 12. | (0) |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 35.77 | 54.75 | 9.75 | (0) | 1.5 | .9 | 12 | (0) |
| .177 | .273 | .048 | (0) | .009 | .0045 | .06 | 0 |
| 173.469 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 3.500 | 252 | 9.800 | 980.000 | .63 | .63 | .35 | 56 |
| .450 | 16 | .125 | 0 | .05 | .005 | .15 | 48 |
| 14.8 | 472 | 5.6 | - | .60 | .44 | 1.8 | 80 |
| 136.200 | 754 | 19 | 320.000 | 5.34 | 1.20 | 10.8 | 26 |
| 328.419 | 1,494 | 34.525 | 1,300 | 6.62 | 2.275 | 13.10 | 210 |
| 1.46 | 6.62 | .152 | 5.76 | .02 | .010 | .06 | .92 |

Table 19 (Conti

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Sandwich | | | | | |
| Bread, enriched | 7.5 | $ 1.10 | $ - | 9,352.5 | 289.50 |
| Bread, whole wheat | 7.5 | 1.10 | - | 8,182.5 | 316.5 |
| Margarine | 2.5 | 1.03 | - | 8,173 | 6.75 |
| Total | 16 | 3.23 | - | 25,708 | 612.75 |
| Portion, 2 oz. | | .025 | - | 200.8 | 4.78 |
| White Cake | | | | | |
| Lard | 2 | .660 | - | 8,190 | 0 |
| Sugar | 6 | .480 | - | 10,688 | (0) |
| Eggs, dried | .469 | - | .680 | 1,260.46 | 99.6 |
| Vanilla | .06 | .036 | - | - | - |
| Flour, enriched | 5 | .380 | - | 8,265 | 170 |
| Salt | .03 | - | - | - | - |
| Baking Powder | .25 | .038 | - | - | - |
| Milk, dried, non fat | .50 | - | .07 | 821.5 | 80.8 |
| Total | 31.125 | 1.594 | .75 | 29,225 | 350.4 |
| Portion, 2 oz. | | .006 | .003 | 117.36 | 1.4 |
| Cherry Sauce | | | | | |
| Cherries, canned red sour | 6.56 | 1.3500 | - | 1,430.6 | 23.6 |
| Water | - | - | - | - | - |
| Sugar | 2.5 | .2375 | - | 4,370 | (0) |
| Cornstarch | .25 | .0125 | - | 411 | .57 |
| Total | 27.09 | 1.60 | - | 6,211.6 | 24.17 |
| Portion, 2 oz. | | .007 | - | 28.56 | .12 |
| Milk | | | | | |
| Portion, 8 oz. | | .0475 | - | 155 | 7.9 |
| Fruit Juice | | | | | |
| Orange Juice, canned, concentrate | 2 | - | .90 | 2,078 | 38.2 |
| Grapefruit Juice, canned, unsweetened | 18 | - | .90 | 3,096 | 41.4 |
| Sugar | 1 | .10 | - | 1,748 | (0) |
| Total | 18 | .10 | 1.80 | 6,922 | 79.6 |
| Portion, 2 oz. | | .001 | .013 | 48.06 | .46 |

ble 19 (Continued)

| | Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|---|
| | Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| ; | 289.50 | 2,692.5 | 60 | 0 | 8.250 | 5.25 | 75 | - |
| ; | 316.5 | 3,270 | 75 | 0 | 10.05 | 4.43 | 100.500 | - |
| | 6.75 | 328 | 0 | 37,500 | (0) | (0) | (0) | (0) |
| | 612.75 | 6,290.5 | 135 | 37,500 | 18.30 | 9.68 | 175.5 | (0) |
| ) | 4.78 | 49.14 | 1.06 | 292 | .14 | .08 | 1.38 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 6 | 99.6 | 404.5 | 18.75 | 7,954.7 | .71 | 2.25 | .52 | 0 |
| | - | - | - | - | - | - | - | - |
| | 170 | 385 | 11.5 | (0) | .70 | .70 | 15 | (0) |
| | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - |
| | 80.8 | 2,951 | 1.3 | (95) | .80 | 4.44 | 2.6 | 16 |
| | 350.4 | 3,740.5 | 31.55 | 8,049.7 | 2.21 | 7.39 | 18.12 | 16 |
| 6 | 1.4 | 15. | .12 | 32.34 | .008 | .03 | .072 | .07 |
| | 23.6 | 328.13 | 9.19 | 21,525 | .85 | .53 | 5.25 | 164.1 |
| | - | - | - | - | - | - | - | - |
| | (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| | .57 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| | 24.17 | 328.13 | 9.19 | 21,525 | .85 | .53 | 5.25 | 164.1 |
| 6 | .12 | 1.50 | .04 | 98.98 | .004 | .002 | .02 | .8 |
| | 7.9 | 268 | .15 | (360) | .08 | .39 | .25 | 3. |
| | 38.2 | 554 | 14.6 | 4,640 | 3.36 | .76 | 10.4 | 2,006 |
| | 41.4 | 648 | 25.2 | 720 | 2.52 | 1.44 | 14.4 | 2,844 |
| | (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| | 79.6 | 1,202 | 39.8 | 5,360 | 5.88 | 2.20 | 24.8 | 4,850 |
| ; | .46 | 8.34 | .26 | 37.2 | .04 | .016 | .18 | 33.68 |

Table 19 (Continu

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| School 112 | | | | | |
| Toasted Cheese on Bun | | | | | |
| Cheese, cheddar | 15 | $ - | $ 7.80 | | |
| Portion, 2 oz. | | - | .056 | 209.75 | 13.16 |
| Buns, enriched | 18 | 3.06 | - | | |
| Portion, 2 oz. | | .022 | - | 175.75 | 5.1 |
| Creamed Peas | | | | | |
| Peas, canned | 25 | 4.04 | - | 7,675 | 385 |
| Evaporated Milk | 4 | .136 | - | 1,250 | 63.6 |
| Margarine | 1 | .41 | - | 3,269 | 2.7 |
| Flour | 1 | .078 | - | 1,654 | 47.7 |
| Total | 30.25 | 4.66 | - | 13,848 | 499 |
| Portion, 4 oz. | | .039 | - | 114.44 | 4.12 |
| Apple Salad | | | | | |
| Fruit Cocktail, canned | 5.39 | 1.17 | - | 1,708.6 | 9.7 |
| Apples | 25 | 1.98 | - | 5,800 | 30 |
| Salad Dressing | 2 | .45 | - | 3,486 | 10 |
| Total | 26.25 | 3.60 | - | 10,994.6 | 49.7 |
| Portion, 3 oz. | | .026 | - | 78.54 | .36 |
| White Cake | | | | | |
| Lard | 2 | .66 | - | 190 | - |
| Sugar | 6 | .56 | - | 10,688 | (0) |
| Eggs | 1.625 | .74 | - | 1,064 | 84 |
| Vanilla | .09 | .105 | - | - | - |
| Flour, enriched | 4.5 | .351 | - | 7,443 | 214.6 |
| Baking Powder | .25 | .038 | - | - | - |
| Milk | 4 | .400 | - | 1,236 | 63.6 |
| Total | 17.5 | 2.85 | - | 28,621 | 362.2 |
| Portion, 2 oz. | | .020 | - | 204.44 | 2.58 |

19 (Continued)

| Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|
| Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 13.16 | 381.88 | .5 | (737.5) | .009 | .231 | (.01) | (0) |
| 5.1 | 31.2 | 1.0 | 0 | .14 | .0875 | 1.25 | 0 |
| 385 | 2,850 | 205 | 61,750 | 12.75 | 7 | 117.5 | 975 |
| 63.6 | 2,206 | 1.6 | 3,640 | .44 | 3.26 | 1.8 | 10 |
| 2.7 | 91 | 0 | 15,000 | (0) | (0) | (0) | (0) |
| 47.7 | 73 | 13 | (0) | 2. | 1.20 | 16 | (0) |
| 499 | 5,220 | 219.6 | 80,390 | 15.19 | 11.46 | 135.3 | 985 |
| 4.12 | 4,312 | 1.80 | 664. | .125 | .096 | 1.12 | 8.16 |
| 9.7 | 221 | 9.7 | 3,934.7 | .27 | .27 | 8.6 | 48.51 |
| 30 | 600 | 30 | 9,000 | 4 | 3 | 17.5 | 450 |
| 10 | 82 | 3.6 | 1,320 | .14 | .28 | (0) | (0) |
| 49.7 | 903 | 43.3 | 14,254.7 | 4.41 | 3.55 | 26.1 | 498.51 |
| .36 | 6.45 | .30 | 101.82 | .033 | .024 | .18 | 3.57 |
| - | - | - | - | - | - | - | - |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 84 | 354.25 | 17.7 | 7,459 | .63 | 1.9 | .49 | 0 |
| - | - | - | - | - | - | - | - |
| 214.6 | 328.5 | 58.5 | (0) | 9. | 5.4 | 72 | 0 |
| - | - | - | - | - | - | - | - |
| 63.6 | 2,144 | 1.2 | 2,880 | .64 | 3.12 | 2 | 24 |
| 362.2 | 2,826.75 | 77.4 | 10,339 | 10.27 | 10.42 | 74.49 | 24 |
| 2.58 | 20.20 | .54 | 73.8 | .08 | .08 | .54 | .18 |

Table 19 (Contin

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Brown Sugar Sauce | | | | | |
| Brown Sugar | 3 | $ .36 | $ - | 4,034 | - |
| Cornstarch | .33 | .033 | - | 548 | .8 |
| Vanilla | .03 | .035 | - | - | - |
| Margarine | .1875 | .077 | - | 612.9 | .51 |
| Total | 8.25 | .506 | - | 5,194.9 | .51 |
| Portion, 1 oz. | | .004 | - | 39.36 | .004 |
| Orange Juice | | | | | |
| Sugar | 1.5 | .13 | - | 2,622 | - |
| Orange Juice, canned concentrate | 6 | - | 2.70 | 6,234 | 114.6 |
| Water | 4.5 | - | - | - | - |
| Total | 5.25 | .13 | 2.70 | 8,856 | 114.6 |
| Portion, 6 oz. | | .001 | .024 | 79.08 | 1.02 |
| Milk | | | | | |
| Portion, 8 oz. | | .05 | - | 155 | 7.9 |
| School 113 | | | | | |
| Roast Beef | | | | | |
| Beef, chuck | 26 | 15.34 | - | | |
| Portion, 1 oz. | | .037 | - | 63.69 | 5.28 |
| Bread | | | | | |
| Bread, enriched | 8.75 | 1.19 | - | | |
| Portion, .8 oz. | | .008 | - | 62.35 | 1.93 |
| Mashed Potatoes | | | | | |
| Salt | | .01 | - | | |
| Potatoes, A.P. | 70 | 3.05 | - | 22,260 | 532 |
| Milk | 12 | .96 | - | 3,708 | 190.8 |
| Butter | 1 | .73 | - | 3,251 | 2.7 |
| Total | 75 | 4.75 | - | 29,219 | 725.5 |
| Portion, 3 oz. | | .012 | - | 73.05 | 1.80 |

ıble 19 (Continued)

| | Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|---|
| | Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| | - | 690 | 23.6 | (0) | (0) | (0) | (0) | (0) |
| | .8 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| | - | - | - | - | - | - | - | - |
| .9 | .51 | 17.10 | 0 | 2,812.5 | (0) | (0) | (0) | (0) |
| .9 | .51 | 707.1 | 23.6 | 2,812.5 | (0) | (0) | (0) | (0) |
| .36 | .004 | 5.35 | .18 | 21.31 | (0) | (0) | (0) | (0) |
| | - | - | - | - | - | - | - | - |
| | 114.6 | 1,662 | 43.8 | 13,920 | 10.08 | 2.28 | 31.2 | 6,018 |
| | - | - | - | - | - | - | - | - |
| | 114.6 | 1,662 | 43.8 | 13,920 | 10.08 | 2.28 | 31.2 | 6,018 |
| .08 | 1.02 | 14.82 | .36 | 124.26 | .090 | .0204 | .276 | 53.76 |
| | 7.9 | 268 | .15 | (300) | .08 | .39 | .25 | 3 |
| .69 | 5.28 | 3.125 | .79 | (0) | .023 | .047 | 1.26 | 0 |
| .35 | 1.93 | 17.95 | .40 | (0) | .055 | .035 | .50 | 0 |
| | 532 | 2,940 | 189 | 4,900 | .28 | 10.50 | 308 | 4,480 |
| | 190.8 | 6,432 | 3.6 | 8,640 | 1.92 | 9.36 | 6. | 72 |
| | 2.7 | 91 | 0 | 15,000 | .01 | .05 | .5 | - |
| | 725.5 | 9,463 | 192.6 | 28,540 | 2.21 | 19.91 | 314.5 | 4,552 |
| .05 | 1.80 | 23.58 | .48 | 71.34 | .006 | .051 | .78 | 11.37 |

Table 19 (Contin

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Con. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Fruit Gelatin | | | | | |
| Gelatin Dessert Powder | 5 | $ .52 | $ - | 8,625 | 213.5 |
| Bananas | 2 | .22 | - | 538 | 7.2 |
| Fruit Cocktail, canned | 6.625 | 1.36 | - | 2,100 | 11.9 |
| Grapes | 2 | .30 | - | 584 | 7 |
| Total | 12.5 | 2.40 | - | 11,847 | 239.6 |
| Portion, 2 oz. | | .024 | - | 118.48 | 2.40 |
| Milk | | | | | |
| Portion, 8 oz. | | .0475 | | 155 | 7.9 |
| Gravy | | | | | |
| Flour | 2 | .0674 | - | 3,308 | 95.4 |
| Broth from Meat | | - | - | - | - |
| Kitchen Bouquet | .25 | .125 | - | - | - |
| Total | 39 | .19 | - | 3,308 | 95.4 |
| Portion, 2 oz. | | .001 | - | 10.3 | .30 |
| School 121 | | | | | |
| Beef and Gravy | | | | | |
| Beef, chuck | 10 | 5.30 | - | 10,190 | 184.4 |
| Flour | 1 | .065 | - | 1,654 | 47.7 |
| Total | 15.875 | 5.37 | - | 11,844 | 232.1 |
| Portion, 2 oz. | | .042 | - | 93.26 | 1.82 |
| Mashed Potatoes | | | | | |
| Potatoes, A.P. | 30 | - | 1.01 | 9,540 | 228 |
| Milk | 10 | .425 | - | 3,090 | 159 |
| Total | 23.875 | .43 | 1.01 | 12,630 | 387 |
| Portion, 3 oz. | | .004 | .009 | 99 | 3 |
| Carrots, Raw | | | | | |
| Carrots, A.P. | 14 | 1.40 | - | | |
| Portion, 1 oz. | | .007 | - | 12 | .3 |

le 19 (Continued)

| | Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|---|
| | Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| | 213.5 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| | 7.2 | 48 | 3.6 | 2,600 | .26 | .28 | 4.4 | 58 |
| | 11.9 | 271.6 | 11.9 | 4,836 | .33 | .33 | 10.6 | 59.6 |
| | 7 | 150 | 5.2 | 660 | .52 | .34 | 2 | 34 |
| | 239.6 | 469.6 | 20.7 | 8,096 | 1.11 | .95 | 17. | 151.6 |
| 8 | 2.40 | 4.70 | .20 | 80.96 | .01 | .01 | .16 | 1.52 |
| | 7.9 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |
| | 95.4 | 146 | 26 | (0) | 4 | 2.4 | 32 | (0) |
| | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - |
| | 95.4 | 146 | 26 | (0) | 4 | 2.4 | 32 | (0) |
| ) | .30 | .46 | .08 | (0) | .012 | .008 | .10 | (0) |
| | 184.4 | 500 | 127 | (0) | 3.60 | 7.50 | 200.20 | 0 |
| | 47.7 | 73 | 13 | (0) | 2 | 1.20 | 16 | (0) |
| | 232.1 | 573 | 140 | (0) | 5.60 | 8.70 | 216.20 | (0) |
| 6 | 1.82 | 4.52 | 1.10 | (0) | .04 | .068 | 1.70 | 0 |
| | 228 | 1,260 | 81 | 2,100 | 12 | 4.50 | 132 | 1,920 |
| | 159 | 5,360 | 3 | (7,200) | 1.60 | 7.80 | 5 | 60 |
| | 387 | 6,620 | 84 | 8,300 | 13.6 | 12.30 | 137 | 1,980 |
| | 3 | 51.99 | .66 | 65.19 | .12 | .09 | 1.08 | 15.6 |
| | .3 | 11 | .2 | 3420 | .02 | .02 | .17 | 1.7 |

Table 19 (Continued)

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. | Cal |
|---|---|---|---|---|---|---|
| Celery Sticks | | | | | | |
| Celery | 3.75 | $ .57 | $ - | | | |
| Portion, .5 oz. | | .006 | - | 3 | .2 | |
| Fruit Gelatin | | | | | | |
| Gelatin Dessert Powder | 6.5 | 2.20 | - | 11,213 | 277.6 | |
| Peaches, canned | 6.625 | .95 | - | 2,041 | 11.9 | |
| Fruit Cocktail, canned | 6.875 | 1.23 | - | 2,179 | 12.4 | |
| Total | 30 | 4.38 | - | 15,433 | 301.9 | |
| Portion, 3 oz. | | .027 | - | 76.6 | 1.89 | |
| Sandwich | | | | | | |
| Bread, W. W. | 2.5 | .425 | - | 2,727.5 | 105.2 | 1, |
| Bread, enriched | 2.5 | .425 | - | 3,117.5 | 96.5 | |
| Margarine | 1.5 | .615 | - | 4,904 | 4.10 | |
| Total | 6.5 | 1.47 | - | 10,749 | 205.8 | 2, |
| Portion, 1.25 oz. | | .021 | - | 125.5 | 2.4 | |
| Milk | | | | | | |
| Portion, 8 oz. | | .0475 | - | 155 | 7.9 | |
| School 122 | | | | | | |
| Potato Soup | | | | | | |
| Potatoes, A.P. | 13 | - | .49 | 4,134 | 98.8 | |
| Milk | 60 | 4.05 | - | 18,540 | 954 | 32, |
| Onions | 3 | .075 | - | 579 | 18 | |
| Celery | 3 | .36 | - | 156 | 11.1 | |
| Margarine | .5 | .205 | - | 1,635 | 1.4 | |
| Total | 93.75 | 4.69 | .49 | 25,044 | 1,083.3 | 33, |
| Portion, 6 oz. | | .019 | .002 | 100.2 | 4.2 | |
| Crackers | | | | | | |
| Portion, $\frac{1}{2}$ oz. | | 2 | - | 61 | 1.3 | |

Table 19 (Continued)

| d gv . | Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|---|
| 3 | .2 | 7 | .1 | 0 | .01 | .01 | .06 | 1 |
| 3 | 277.6 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 1 | 11.9 | 152 | 11.9 | 13,648 | .20 | .60 | 20.54 | 126 |
| 9 | 12.4 | 282 | 12.4 | 5,019 | .34 | .34 | 11 | 62 |
| 3 | 301.9 | 434 | 24.3 | 18,667 | .54 | .94 | 31.54 | 188 |
| 6.6 | 1.89 | 2.73 | .15 | 116.67 | .003 | .006 | .18 | 1.17 |
| 7.5 | 105.2 | 1,090 | 25 | 0 | 3.35 | 1.47 | 33.5 | 0 |
| 7.5 | 96.5 | 897.5 | 20 | 0 | 2.75 | 1.75 | 25 | 0 |
| 4 | 4.10 | 137 | .00 | 22,500 | (0) | (0) | (0) | (0) |
| 9 | 205.8 | 2,124.5 | 45 | 22,500 | 6.10 | 3.22 | 58.5 | 0 |
| 5.5 | 2.4 | 24.7 | .52 | 262.8 | .071 | .037 | .69 | 0 |
| 5 | 7.9 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |
| 4 | 98.8 | 546 | 35.1 | 910 | 5.2 | 1.95 | 57.20 | 832 |
| 0 | 954 | 32,160 | 18 | 43,200 | 9.6 | 46.80 | 30 | 360 |
| 9 | 18 | 411 | 6.3 | 630 | .42 | .45 | 2.70 | 114 |
| 6 | 11.1 | 429 | 4.2 | 0 | .45 | .33 | 3.60 | 60 |
| 5 | 1.4 | 46 | .00 | 7,500 | (0) | (0) | (0) | (0) |
| 4 | 1,083.3 | 33,592 | 63.6 | 522.40 | 15.67 | 49.53 | 93.50 | 1,366 |
| 0.2 | 4.2 | 134.4 | .24 | 208.8 | .06 | .18 | .36 | 5.4 |
| 1 | 1.3 | 3 | .1 | (0) | .009 | .006 | .15 | (0) |

Table 19 (Conti

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Carrots | | | | | |
| Carrots, A.P. | 10 | $ 1.30 | $ - | | |
| Portion, ½ oz. | | .004 | - | 6 | .2 |
| Cheese Sandwich | | | | | |
| Cheese, cheddar | 5 | - | 2.60 | 8,390 | 526.5 |
| Bread, enriched | 12 | 1.32 | - | 14,964 | 463.2 |
| Salad Dressing | 1.25 | .4375 | - | 2,179 | 6.3 |
| Bread, wholewheat | 13 | 1.43 | - | 14,183 | 548.6 |
| Total | 31.25 | 3.19 | 2.60 | 39,716 | 1,544.6 |
| Portion, 1.25 oz. | | .010 | .008 | 99 | 3.9 |
| Gingerbread | | | | | |
| Lard | 3 | .99 | - | 9,285 | 0 |
| Sugar | 7 | .665 | - | 12,236 | (0) |
| Eggs | 3 | 1.166 | - | 1,965 | 155.1 |
| Molasses | 5.3 | .98 | - | 5,586 | - |
| Flour, Wh., enriched | 8.5 | 1.3695 | - | 14,059 | 405 |
| Salt | .06 | .011 | - | - | - |
| Soda | .125 | .008 | - | - | - |
| Ginger | .125 | .056 | - | - | - |
| Cinnamon | .003 | .002 | - | - | - |
| Nutmeg | .003 | .005 | - | - | - |
| All Spice | .003 | .001 | - | - | - |
| Total | 31.5 | 5.25 | - | 43,131 | 560.1 |
| Portion, 1.5 oz. | | .016 | | 128.4 | 1.7 |
| Orange Juice | | | | | |
| Orange Juice, canned, concentrate | 8 | - | 3.53 | 8,312 | 152.8 |
| Sugar | 1 | .095 | - | 1,748 | (0) |
| Water | | - | - | - | - |
| Total | 56 | .095 | 3.53 | 10,060 | 152.8 |
| Portion, 4 oz. | | .0004 | .015 | 44.8 | .68 |
| Milk | | | | | |
| Portion, 8 oz. | | .0475 | - | 155 | 7.9 |

le 19 (Continued)

| Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|
| Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| .2 | 6 | .1 | 1,710 | .008 | .008 | .009 | 1 |
| 526.5 | 15,275 | 20.5 | (29,500) | .35 | 9.25 | (.5) | (0) |
| 463.2 | 4,308 | 96 | (0) | 13.20 | 8.40 | 120 | 0 |
| 6.3 | 51 | 2.3 | 825 | .09 | .18 | (0) | 0 |
| 548.6 | 5,668 | 130 | 0 | 17.42 | 7.67 | 174 | 0 |
| 1,544.6 | 25,302 | 248.8 | 30,325 | 31.06 | 25.50 | 294.5 | 0 |
| 3.9 | 63.2 | .6 | 75.7 | .07 | .06 | .74 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 155.1 | 654 | 32.7 | 13,770 | 1.17 | 3.51 | .9 | 0 |
| - | 6,980 | 144.2 | - | - | - | - | - |
| 405 | 621 | 110.5 | (0) | 17 | 10.20 | 136 | (0) |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 560.1 | 8,255 | 287.4 | 13,770 | 18.17 | 13.71 | 136.9 | 0 |
| 1.7 | 24.6 | .85 | 40.9 | .054 | .040 | .41 | 0 |
| 152.8 | 2,216 | 58.4 | (17,560) | 13.44 | 3.04 | 41.6 | 8,024 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| - | - | - | - | - | - | - | - |
| 152.8 | 2,216 | 58.4 | (17,560) | 13.44 | 3.04 | 41.6 | 8,024 |
| .68 | 10 | .24 | 78.4 | .060 | .012 | .18 | 36.84 |
| 7.9 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |

Table 19 (Continued

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. | Ca |
|---|---|---|---|---|---|---|
| School 123 | | | | | | |
| Baked Hash | | | | | | |
| Beef, ground, chuck | 36 | $19.08 | $ - | 36,684 | 3,038 | |
| Potatoes, A.P. | 45 | - | 1.46 | 14,310 | 342 | |
| Onions, dried | 1.75 | 1.40 | - | 338 | 11 | |
| B.V. | 1 | .018 | | ? | ? | |
| Salt | | .005 | | - | - | |
| Total | 70.5 | 20.50 | 1.46 | 51,332 | 3,391 | |
| Portion, 5 oz. | | .091 | .006 | 227.5 | 15.05 | |
| Tomatoes | | | | | | |
| Tomatoes, canned | 17 | - | 2.88 | 1,462 | 76.5 | |
| Margarine | .5 | .18 | - | 1,635 | 1.35 | |
| Butter | .5 | .355 | - | 1,625 | 1.35 | |
| Total | 18 | .54 | 2.88 | 4,722 | 79.2 | |
| Portion, 3 oz. | | .006 | .03 | 49.2 | .81 | |
| Apple Crisp | | | | | | |
| Sugar | 10.5 | .92 | - | 18,354 | (0) | |
| Apples | 48 | 3.75 | - | 11,136 | 57.6 | |
| Lard | 3.5 | 1.23 | - | 14,333 | - | |
| Flour | 2 | .07 | - | 3,308 | 95.4 | |
| Oatmeal | 1 | .12 | - | 1,770 | 64.5 | |
| Cinnamon | .3 | .05 | - | - | - | |
| Salt | .125 | .01 | - | - | - | |
| Cream, 18% | 2 | 1.52 | - | 2,994 | 20.4 | |
| Total | 48 | | | 51,895 | 237.9 | |
| Portion, 2.5 oz. | | 7.67 | - | 169 | .8 | |
| Milk | | | | | | |
| Portion, 8 oz. | | .0475 | - | 155 | 7.9 | |
| Sandwich | | | | | | |
| Bread, enriched | 9 | ( | | 11,223 | 347 | |
| Bread, whole wheat | 7.5 | ( 1.87 | | 8,183 | 316.5 | |
| Margarine | 1 | .36 | | 3,269 | 2.7 | |
| Butter | 1 | .71 | | 3,251 | 2.75 | |
| Total | 77 | 2.94 | | 25,926 | 668.95 | |
| Portion, 1 oz. | | .011 | | 95 | 2.5 | |

e 19 (Continued)

| Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| 3,038 | 1,800 | 457.2 | (0) | 12.96 | 27 | 727.2 | 0 |
| 342 | 1,890 | 121.5 | 3,150 | 18 | 6.75 | 198 | 2,880 |
| 11 | 234 | 3.68 | 368 | .25 | .26 | 1.58 | 67 |
| ? | ? | 1.43 | 0 | .02 | 1.06 | 18.48 | 0 |
| - | - | - | - | - | - | - | - |
| 3,391 | 3,924 | 583.81 | 3,518 | 31.23 | 35.07 | 945.26 | 2,947 |
| 15.05 | 17.5 | 2.60 | 15.5 | .140 | .155 | 4.18 | 13 |
| 76.5 | (850) | (45.9) | 81,090 | 4.25 | 2.55 | 54.4 | 1,275 |
| 1.35 | 46 | .0 | 7,500 | (0) | (0) | (0) | (0) |
| 1.35 | 46 | .0 | 7,500 | .005 | .025 | .25 | (0) |
| 79.2 | 942 | 45.9 | 96,090 | 4.26 | 2.58 | 54.65 | 1,275 |
| .81 | 9.9 | .48 | 1,000.8 | .03 | .027 | .57 | 13.2 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 57.6 | 1,152 | 57.6 | 17,280 | 7.68 | .58 | 33.60 | 864 |
| - | - | - | - | - | - | - | - |
| 95.4 | 146 | 26 | (0) | 4 | 2.40 | 32. | (0) |
| 64.5 | 241 | 20.4 | (0) | 2.71 | .62 | 4.70 | (0) |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 20.4 | 354 | .4 | 13,020 | .22 | 1.02 | .6 | 6 |
| 237.9 | 1,893 | 104.4 | 30,300 | 14.61 | 4.62 | 70.9 | 870 |
| .8 | 6.25 | .35 | 98.5 | .047 | .015 | .22 | 2.75 |
| 7.9 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |
| 347 | 3,231 | 72 | 0 | 9.9 | 6.3 | 90 | 0 |
| 316.5 | 3,270 | 75 | 0 | 10.1 | 4.43 | 100.1 | 0 |
| 2.7 | 91 | .0 | 15,000 | (0) | (0) | (0) | (0) |
| 2.75 | 91 | .0 | 15,000 | .01 | .05 | .5 | 0 |
| 668.95 | 6,683 | 147 | 30,000 | 20.01 | 11.17 | 190.9 | 0 |
| 2.5 | 24.6 | .54 | 110.3 | .07 | .04 | .70 | 0 |

Table 19 (Con

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| School 211 | | | | | |
| Barbecued Hamburger | | | | | |
| Onions | 2.25 | $ .195 | $ - | 434 | 13.5 |
| Ground Beef, chuck | 10 | 4.50 | - | 10,190 | 844 |
| Pickle Relish | .75 | .137 | - | 337.5 | 2.5 |
| Catsup | 1 | .32 | - | 446 | 9.1 |
| Total | 13.5 | 5.15 | - | 11,407.5 | 869.1 |
| Portion, 2 oz. | | .048 | - | 105.6 | 8 |
| Bun | | | | | |
| Buns, enriched | | 1.62 | - | | |
| Portion, 1.25 oz. | | .015 | - | 112 | 3.2 |
| Potato Chips | | | | | |
| Potato Chips | 6 | 2.88 | - | | |
| Portion, 1 oz. | | .029 | - | 154 | 1.9 |
| Creamed Peas | | | | | |
| Peas, canned | 13.25 | 1.78 | - | 4,068 | 204 |
| Flour | .5 | .033 | - | 877 | 23.9 |
| Milk | 3 | .24 | - | 927 | 47.7 |
| Total | 12.25 | 2.05 | - | 5,872 | 275.6 |
| Portion, 2 oz. | | .021 | - | 59.8 | 2.82 |
| Celery Sticks | | | | | |
| Celery, A.P. | 5 | .75 | - | | |
| Portion, ½ oz. | | .008 | - | 3 | .2 |
| Tutti Fruiti Ball | | | | | |
| Prunes, Dr. | .5 | - | .09 | 518 | 4.5 |
| Figs, Dr. | .5 | - | .075 | 614 | 9.1 |
| Apples, Dr. | 1 | - | .23 | 1,256 | 6.4 |
| Raisins, Dr. | .5 | - | .095 | 609 | 5.2 |
| Walnut Meats | .25 | - | .395 | 743 | 17 |
| Pineapple Juice | 1.25 | .28 | - | 276 | 1.7 |
| Sugar, powdered | 1 | .17 | - | 1,748 | (0) |
| Total | 4.156 | .45 | .89 | 5,764 | 43.9 |
| Portion, .75 oz. | | .005 | .01 | 65 | .49 |

19 (Continued)

| Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|
| Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 13.5 | 308 | 4.7 | 472.5 | .32 | .34 | 2.03 | 85.5 |
| 844 | 500 | 127 | (0) | 3.6 | 7.50 | 202 | 0 |
| 2.5 | 51 | 4 | 360 | (0) | .06 | Tr. | 23 |
| 9.1 | 54 | 3.6 | (8,540) | .41 | .32 | 10.2 | 51 |
| 869.1 | 913 | 139.3 | 9,372.5 | 4.33 | 8.22 | 214.23 | 159.5 |
| 8 | 8 | 1.28 | 86.8 | .04 | .076 | 1.98 | 1.48 |
| 3.2 | 20 | .6 | (0) | .09 | .05 | .78 | (0) |
| 1.9 | 8.5 | (.54) | (14) | (.05) | (.03) | (.91) | 3 |
| 204 | 1,510.5 | 108.6 | 32,727 | 6.75 | 3.71 | 62.27 | 516.7 |
| 23.9 | 36.5 | 6.5 | (0) | 1 | .60 | 8 | (0) |
| 47.7 | 1,508 | .9 | 2,160 | .48 | 2.34 | 1.50 | 18 |
| 275.6 | 3,055 | 116 | 34,887 | 8.23 | 6.65 | 71.77 | 534.7 |
| 2.82 | 31.2 | 1.18 | 355.8 | .084 | .068 | .73 | 5.4 |
| .2 | 7 | .07 | (0) | .01 | .01 | .06 | 1 |
| 4.5 | 104 | 7.5 | 3,650 | .19 | .32 | 3.3 | 5.5 |
| 9.1 | 422 | 6.8 | 185 | .36 | .27 | 3.9 | (0) |
| 6.4 | 43 | 6.4 | (0) | .43 | .43 | 4.4 | 53 |
| 5.2 | 177 | 7.5 | 115 | .35 | .19 | 1.1 | Tr. |
| 17 | 94 | 2.4 | 40 | .54 | .15 | 1.3 | 4 |
| 1.7 | 85 | 2.9 | 450 | .30 | .09 | 1.0 | 51 |
| (0) | (0) | - | (0) | (0) | (0) | (0) | (0) |
| 43.9 | 925 | 33.5 | 4,440 | 2.17 | 1.45 | 15 | 113.5 |
| .49 | 10.4 | .37 | 50.8 | .025 | .016 | .17 | 1 |

Table 19 (Contir

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Bread Pudding, vanilla sauce | | | | | |
| Bread, enriched | 2.5 | $ .28 | $ - | 3,118 | 96.50 |
| Milk, dried, non fat | .875 | - | .13 | 1,437.6 | 141.40 |
| Eggs, dried | .4375 | - | .58 | 1,176.4 | 92.97 |
| Sugar | 6.5 | .520 | - | 11,362 | (0) |
| Vanilla | .125 | .068 | - | - | - |
| Nutmeg | .0625 | .105 | - | - | - |
| Cornstarch | .3125 | .015 | - | 513.7 | .72 |
| Butter | .25 | .157 | - | 813 | .54 |
| Total | 12.5 | 1.15 | .71 | 18,420.7 | 332.13 |
| Portion, 2 oz. | | .012 | .007 | 184.2 | 3.32 |
| Milk | | | | | |
| Portion, 8 oz. | | .0425 | - | 155 | 7.9 |
| Orange Juice | | | | | |
| Orange Juice, canned, concentrate | 1.3125 | - | 1.04 | 1,363.7 | 25.07 |
| Sugar | 1 | .09 | - | 1,748 | (0) |
| Water | | | | | |
| Total | 74 | .09 | 1.04 | 3,111.7 | 25.07 |
| Portion, 4 oz. | | .001 | .014 | 42.4 | .36 |
| School 212 | | | | | |
| Scalloped Ham and Noodles | | | | | |
| Noodles | 14 | 2.80 | - | 24,206 | 800.8 |
| Ham, smoked, boneless | 54 | 33.92 | - | 95,418 | 4,141.8 |
| Cheese, cheddar | 2 | 1.06 | - | 3,612 | 227 |
| Mustard | .0125 | .02 | - | - | - |
| Salt | .0625 | .02 | - | - | - |
| Total | 120 | 37.82 | - | 123,236 | 5,169.6 |
| Portion, 5 oz. | | .095 | - | 321 | 13.45 |
| Peas | | | | | |
| Peas, canned | 30 | 5.05 | - | | |
| Portion, 3 oz. | | .034 | - | 58 | 2.9 |

le 19 (Continued)

| Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| 96.50 | 898 | 20 | 0 | 2.75 | 1.75 | 25 | 0 |
| 141.40 | 5,164.2 | 2.27 | 166.2 | 1.40 | 7.77 | 4.55 | 28 |
| 92.97 | 377.6 | 17.50 | 7,424.4 | .665 | 2.096 | .481 | 0 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| .72 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| .54 | 23 | 0 | 3,750 | .0025 | .0125 | .125 | 0 |
| 332.13 | 6,462.8 | 39.77 | 11,340.6 | 4.8175 | 11.628 | 30.156 | 28 |
| 3.32 | 64.6 | .38 | 113.4 | .048 | .116 | .302 | .28 |
| 7.9 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |
| 25.07 | 363.6 | 9.58 | (3,045) | 2.205 | .499 | 6.825 | 1,316.44 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 25.07 | 363.6 | 9.58 | 3,045 | 2.205 | .499 | 6.825 | 1,316.44 |
| .36 | 4.8 | .09 | 41.6 | .028 | .008 | .092 | 18 |
| 800.8 | 1,400 | 133 | 12,460 | 12.74 | 7 | 145.6 | (0) |
| 4,141.8 | 2,430 | 615.6 | (0) | 171.18 | 45.90 | 966.6 | 0 |
| 227 | 6,984 | 9 | 12,720 | .22 | 2.82 | .2 | (0) |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 5,169.6 | 10,814 | 757.6 | 25,180 | 184.14 | 55.72 | 1,112.4 | 0 |
| 13.45 | 28 | 1.95 | 65.5 | .480 | .145 | 2.90 | 0 |
| 2.9 | 21 | 1.54 | 463 | .10 | .05 | .88 | 7.3 |

Table 19 (Conti

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Carrot Sticks | | | | | |
| Carrots, A.P. | 3 | $ .24 | $ | | |
| Portion, ½ oz. | | .003 | - | 6 | .2 |
| Celery Sticks | | | | | |
| Celery, A.P. | 3 | .45 | | | |
| Portion, ½ oz. | | .006 | - | 3 | .2 |
| Rolls and Butter | | | | | |
| Rolls, enriched | | 1.60 | - | | |
| Portion, 1 oz. | | .013 | - | 88 | 2.6 |
| Butter | | 1.50 | - | - | - |
| Portion, .3 oz. | | .013 | - | 68 | .06 |
| Milk | | | | | |
| Portion, 8 oz. | | .045 | - | 155 | 7.9 |
| Chocolate Cake | | | | | |
| Lard | 3 | .990 | - | 12,295 | 0 |
| Sugar | 9 | .810 | - | 15,732 | (0) |
| Eggs | 2.5 | 1. | - | 1,637.5 | 129.25 |
| Flour, pastry | 6 | .396 | - | 9,918 | 204 |
| Soda | .125 | .007 | - | - | - |
| Baking Powder | .125 | .087 | - | - | - |
| Salt | .125 | .001 | - | - | - |
| Buttermilk | 6 | .510 | - | 972 | 95.4 |
| Cocoa | 1 | .350 | - | 1,331 | (36.3) |
| Water | 1.5 | - | - | - | - |
| Vanilla | .0625 | .030 | - | - | - |
| Total | 9.75 | 4.18 | - | 41,885.5 | 464.95 |
| Portion, 2 oz. | | .056 | - | 533.6 | 5.92 |

(Continued)

| otein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| .2 | 6 | .11 | 1,714 | .01 | .01 | .09 | .9 |
| .2 | 7 | .07 | 0 | .01 | .01 | .06 | 1 |
| 2.6 | 16 | .50 | 0 | .07 | .04 | .69 | 0 |
| - | - | - | - | - | - | - | - |
| .06 | 2 | 0 | 313 | Tr. | Tr. | .01 | 0 |
| 7.9 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 129.25 | 545 | 27.3 | 11,475 | .975 | 2.925 | .75 | 0 |
| 204 | 462 | 13.8 | (0) | .84 | .84 | 18 | (0) |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 95.4 | (3,216) | 1.8 | 60 | .48 | 4.86 | 3 | 36 |
| (36.3) | 568 | 52.7 | (120) | .55 | 1.74 | 10.4 | (0) |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 464.95 | 4,791 | 95.6 | 11,655 | 2.845 | 10.365 | 32.15 | 36 |
| 5.92 | 61 | 1.22 | 148 | .036 | .132 | .410 | .5 |

Table 19 (Contin

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| School 213 | | | | | |
| Baked Beans | | | | | |
| Beans, dried, Great Northern | 18 | $ 2.88 | $ - | 27,666 | 1,749.6 |
| Bacon | .67 | .50 | - | 1,914 | 27.67 |
| Salt | .125 | .01 | - | - | - |
| Pepper | .0625 | .03 | - | - | - |
| Catsup | 5 | - | .80 | 2,230 | 45.5 |
| Honey | 3 | - | .60 | 3,999 | 4.2 |
| Margarine | 1 | .34 | - | 3,269 | 2.7 |
| Total | 43.75 | 3.76 | 1.40 | 39,078 | 1,829.67 |
| Portion, 4 oz. | | .021 | .008 | 223.2 | 10.44 |
| Cole Slaw | | | | | |
| Cabbage | 17 | 1.12 | - | 1,360 | 78.2 |
| Salad Dressing | 1.5 | .074 | .01 | 1,117 | 7.21 |
| Onion | .53 | .025 | - | 102.29 | 3.18 |
| Celery Seed | .0625 | .046 | - | - | - |
| Salt | .125 | - | - | - | - |
| Total | 16.375 | 1.27 | .01 | 2,579.3 | 88.59 |
| Portion, 1.5 oz. | | .007 | - | 14.7 | .51 |
| Fruit Gelatin | | | | | |
| Gelatin Dessert Powder | 4.375 | 1.33 | - | 7,546.8 | 186.8 |
| Oranges | 3 | .98 | - | 441 | 8.7 |
| Grapefruit | 7 | .56 | - | 833 | 10.5 |
| Walnut Meats | 1 | - | .79 | 2,972 | 68.1 |
| Water | 20 | - | - | - | - |
| Total | 22 | 2.87 | .79 | 11,792.8 | 274.1 |
| Portion, 2 oz. | | .017 | .005 | 67 | 1.56 |
| Peanut Butter Sandwich | | | | | |
| Bread, enriched | 15 | 1.70 | - | 18,705 | 579 |
| Margarine | 3 | 1.02 | - | 9,807 | 8.1 |
| Apricot Jam | 1 | - | .26 | 1,263 | 2.3 |
| Peanut Butter | 3 | - | .99 | 7,845 | 355.5 |
| Total | 22 | 2.72 | 1.25 | 37,620 | 944.9 |
| Portion, 1.5 oz. | | .012 | .005 | 160.5 | 4.02 |

le 19 (Continued)

| Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| 1,749.6 | 13,320 | 563.4 | 0 | 55.08 | 18.72 | 178.2 | 144 |
| 27.67 | 39.5 | 2.41 | (0) | 1.159 | .362 | 5.829 | 0 |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 45.5 | 27 | 18 | (42,700) | 2.05 | 1.60 | 51 | 255 |
| 4.2 | 69 | 12.3 | (0) | .06 | .51 | 3 | 48 |
| 2.7 | 91 | .0 | 15,000 | (0) | (0) | (0) | (0) |
| 1,829.67 | 13,546.5 | 596.11 | 57,700 | 58.349 | 21.192 | 238.029 | 447 |
| 10.44 | 77.40 | 3.40 | 329.6 | .332 | .120 | 1.36 | 2.56 |
| 78.2 | 2,584 | 28.9 | 4,590 | 3.4 | 2.89 | 17 | 2,805 |
| 7.21 | 28 | 1.74 | 379 | .129 | .168 | .775 | 0 |
| 3.18 | 72.6 | 1.11 | 111.3 | (.074) | .079 | .477 | 20 |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 88.59 | 2,684.6 | 31.75 | 5,080.3 | 3.603 | 3.137 | 18.252 | 2,825 |
| .51 | 15.3 | .18 | 29.1 | .021 | .018 | .105 | 16.2 |
| 186.8 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 8.7 | 324 | 3.9 | 1,860 | .75 | .27 | .24 | 486 |
| 10.5 | 462 | 4.2 | 140 | .77 | .42 | 4.20 | 847 |
| 68.1 | 377 | 9.5 | 160 | 2.17 | .60 | 5.40 | 13 |
| - | - | - | - | - | - | - | - |
| 274.1 | 1,163 | 17.6 | 2,160 | 3.69 | 1.29 | 9.84 | 1,346 |
| 1.56 | 6.6 | .10 | 12.2 | .020 | .008 | .056 | 7.6 |
| 579 | 5,385 | 120 | 0 | 16.50 | 10.50 | 150 | 0 |
| 8.1 | 273 | .0 | 45,000 | (0) | (0) | (0) | (0) |
| 2.3 | 54 | 1.4 | 50 | .07 | .11 | .7 | 26 |
| 355.5 | 1,008 | 25.8 | 0 | 1.62 | 1.80 | 220.5 | (0) |
| 944.9 | 6,720 | 147.2 | 45,050 | 18.19 | 12.41 | 371.2 | 26 |
| 4.02 | 29.6 | .63 | 191.8 | .078 | .052 | 1.58 | .10 |

Table 19 (Cont

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Milk | | | | | |
| Portion, 8 oz. | | $ .05 | $ - | 155 | 7.9 |
| Salad Dressing[a] | | | | | |
| Vinegar | 2 | .12 | - | 112 | - |
| Sugar | 2 | .19 | - | 3,496 | (0) |
| Eggs, dried | .125 | - | .17 | 336 | 26.56 |
| Flour | .25 | .017 | - | 414 | 11.9 |
| Total | 8 | .127 | .17 | 4,358 | 38.46 |
| School 221 | | | | | |
| Beef and Noodles | | | | | |
| Beef, chuck | 12 | 7.80 | - | 12,228 | 1,012.8 |
| Flour | 3.25 | .217 | - | 5,375.5 | 155 |
| Salt | .0625 | .001 | - | - | - |
| Eggs, dried | 2 | - | 2.70 | 5,378 | 425 |
| Total, (292 oz.) | 18.25 | 8.02 | 2.70 | 22,981.5 | 1,592.8 |
| Portion, 2.5 oz. | | .057 | .019 | 196.7 | 13.75 |
| Buttered Peas | | | | | |
| Peas, canned | 7.8625 | 3.36 | - | 2,398 | 120.31 |
| Butter | .5 | .345 | - | 1,626 | 1.35 |
| Total | 8.185 | 3.71 | - | 4,024 | 121.66 |
| Portion, 1.5 oz. | | .034 | - | 46.3 | 1.41 |
| Bread and Honey Butter | | | | | |
| Flour, enriched | 7.5 | .502 | - | 12,405 | 357.75 |
| Milk | 4 | .360 | - | 1,236 | 63.6 |
| Lard | .5 | .165 | - | 2,048 | 0 |
| Sugar | .25 | .023 | - | 436 | (0) |
| Salt | .03 | .001 | - | - | - |
| Yeast | .25 | .117 | - | 97 | 12 |
| Honey | 3 | - | .51 | 1,333 | 1.4 |
| Butter | 1 | .690 | - | 3,251 | 2.7 |
| Total | 11.5 | 1.86 | .51 | 20,806 | 437.45 |
| Portion, 1.5 | | .015 | .004 | 169.6 | 3.55 |

[a]1.5 pounds used in Cole Slaw.

ıle 19 (Continued)

| Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|
| Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 7.9 | 268 | .15 | 360 | .08 | .39 | .25 | 3 |
| - | 64 | 4.6 | - | - | - | - | - |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 26.56 | 107.8 | 5 | 2,121 | .19 | .599 | .138 | 0 |
| 11.9 | 18 | 4.3 | (0) | .5 | .3 | 4 | (0) |
| 38.46 | 125.8 | 9.3 | 2,121 | .69 | .899 | 4.138 | 0 |
| 1,012.8 | 600 | 152.7 | (0) | 4.32 | 9 | 242.4 | 0 |
| 155 | 237.2 | 42.2 | (0) | 6.50 | 3.90 | 52 | (0) |
| - | - | - | - | - | - | - | - |
| 425 | 1,726 | 40 | 33,940 | 3.04 | 9.58 | 2.2 | 0 |
| 1,592.8 | 2,563.2 | 234.9 | 33,940 | 13.86 | 22.48 | 296.6 | 0 |
| 13.75 | 22 | 2 | 290.5 | .117 | .192 | 2.54 | 0 |
| 120.31 | 890.6 | 64.06 | 19,296.9 | 3.984 | 2.265 | 36.718 | 304.7 |
| 1.35 | 45.5 | .0 | 7,500 | .005 | .025 | .25 | 0 |
| 121.66 | 936.1 | 64.06 | 25,240.1 | 3.989 | 2.290 | 36.743 | 304.7 |
| 1.41 | 10.8 | .73 | 291.1 | .046 | .025 | .424 | 3.4 |
| 357.75 | 547.5 | 97.5 | (0) | 1.50 | 9 | 120 | (0) |
| 63.6 | 2,144 | 1.2 | 2,880 | .64 | 3.12 | 2 | 24 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| - | - | - | - | - | - | - | - |
| 12 | 28.5 | 5.5 | (0) | 10.99 | 6.19 | 41 | (0) |
| 1.4 | 23 | 4.1 | (0) | .02 | .17 | 1 | 16 |
| 2.7 | 91 | :0 | 15,000 | .01 | .05 | .5 | 0 |
| 437.45 | 2,834 | 108.3 | 17,880 | 13.16 | 18.53 | 164.5 | 40 |
| 3.55 | 23.1 | .88 | 145.8 | .108 | .151 | 1.341 | .3 |

Table 19 (C

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Prote Gm. |
|---|---|---|---|---|---|
| Milk | | | | | |
| Portion, 8 oz. | | $ .045 | $ - | 155 | |
| Apple Crisp | | | | | |
| Apples, dried | 4 | - | .96 | 928 | |
| Sugar, brown | 3 | .270 | - | 5,034 | ( |
| Flour, enriched | 1 | .067 | - | 1,654 | 4 |
| Butter | 1 | .690 | - | 3,251 | |
| Cinnamon | .03 | .025 | - | - | |
| Total | 15.25 | 1.05 | .96 | 10,867 | 5 |
| Portion, 2 oz. | | .009 | .008 | 89 | |
| Orange and Grapefruit Juice | | | | | |
| Orange Juice, canned, concentrate | 4 | - | 1.80 | 4,156 | 7 |
| Sugar | 1.5 | .143 | - | 2,622 | ( |
| Grapefruit Juice, canned, sweetened | 2 | - | .11 | 470 | |
| Total | 26 | .14 | 1.91 | 7,248 | 8 |
| Portion, 4 oz. | | .001 | .017 | 64 | |
| School 222 | | | | | |
| Beans with Ham | | | | | |
| Beans, dried, Great Northern | 10 | 1.50 | - | 15,370 | 9 |
| Ham, smoked, boneless | 8 | 5.36 | - | 14,136 | 61 |
| Onions | 1 | .05 | - | 193 | |
| Margarine | 1 | .36 | - | 3,269 | |
| Total | 41 | 7.27 | - | 32,968 | 71 |
| Portion, 6 oz. | | .073 | - | 301.8 | |

ble 19 (Continued)

| Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| 7.9 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |
| 4.8 | 96 | 4.8 | 1,440 | .64 | .48 | 2.8 | 72 |
| (0) | 1,035 | 35.4 | (0) | (0) | (0) | (0) | (0) |
| 47.7 | 73 | 13 | (0) | 2 | 1.2 | 16 | (0) |
| 2.7 | 91 | 0 | 15,000 | .01 | .05 | .5 | 0 |
| - | - | - | - | - | - | - | - |
| 55.2 | 1,295 | 53.2 | 16,440 | 2.65 | 1.73 | 19.3 | 72 |
| .46 | 10.6 | .44 | 134.8 | .022 | .014 | .158 | .58 |
| 76.4 | 1,008 | 29.2 | (9,280) | 6.72 | 1.52 | 20.8 | 4,012 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 4.6 | 72 | 2.8 | 80 | .28 | .16 | 1.6 | 316 |
| 81 | 1,080 | 32 | 9,360 | 7 | 1.68 | 22.4 | 4,328 |
| .72 | 9.6 | .28 | 83.6 | .064 | .016 | .20 | 38.8 |
| 97.2 | 740 | 31.3 | 0 | 3.06 | 1.04 | 9.9 | 8 |
| 613.6 | 360 | 91.2 | (0) | 25.36 | 6.80 | 143.2 | 0 |
| 6 | 137 | 2.1 | 210 | .14 | .15 | .9 | 38 |
| 2.7 | 91 | .0 | 15,000 | (0) | (0) | (0) | (0) |
| 719.5 | 1,328 | 124.6 | 15,210 | 28.56 | 7.99 | 154 | 46 |
| .8 6.6 | 12 | 1.14 | 139.2 | .258 | .072 | 1.410 | .42 |

Table 19 (Cont

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Corn Bread, Honey and Margarine | | | | | |
| Cornmeal, yellow | 13 | $ .936 | $ - | 21,450 | 466.7 |
| Eggs | 2.625 | .98 | - | 1,719.4 | 135.7 |
| Flour, white enriched | 1 | .06 | - | 1,654 | 47.7 |
| Milk, dried | .5 | - | .07 | 822 | 80.8 |
| Baking Powder | .25 | .04 | - | - | - |
| Salt | .125 | .001 | - | - | - |
| Sugar | 1 | .09 | - | 1,748 | (0) |
| Lard | 1 | .34 | - | 4,095 | (0) |
| Honey | .5 | - | .09 | 667 | .7 |
| Margarine | 1 | .36 | - | 3,269 | 2.7 |
| Total | 34.75 | 2.81 | .16 | 35,424.4 | 734.3 |
| Portion, 3 oz. | | .015 | .001 | 191.1 | 3.9 |
| Celery Sticks | | | | | |
| Celery | 5 | .75 | - | | |
| Portion, .75 oz. | | .008 | - | 3.9 | .2 |
| Gelatin Dessert | | | | | |
| Cherries, red, sour, canned | 6.25 | 1.30 | - | 1,362.5 | 22.5 |
| Fruit Cocktail, canned | 6.375 | 1.60 | - | 2,020.9 | 11.4 |
| Bananas | 6 | .84 | - | 1,614 | 21.6 |
| Gelatin Dessert Powder | 3.75 | 1.40 | - | 6,468.7 | 160.1 |
| Total | 19.1875 | 5.14 | - | 11,466.1 | 215.6 |
| Portion, 3 oz. | | .051 | - | 109.8 | 2.0 |
| Milk | | | | | |
| Portion, 8 oz. | | .045 | - | 155 | 7.9 |
| Orange Juice | | | | | |
| Orange Juice, canned, concentrate | 2.8 | - | 1.12 | 2,909.2 | 53.5 |
| Sugar | 1 | .09 | - | 1,748 | (0) |
| Total | 17.5 | .09 | - | 4,657.2 | 53.5 |
| Portion, 3 oz. | | .001 | .012 | 49.8 | .5 |

le 19 (Continued)

| Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|
| Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 466.7 | 351 | 65 | 17,680 | 7.93 | 2.73 | 61.1 | (0) |
| 135.7 | 572.2 | 28.6 | 12,048 | 1.023 | 3.071 | .787 | 0 |
| 47.7 | 73 | 13 | (0) | 2 | 1.2 | 16 | (0) |
| 80.8 | 2,951 | 1.3 | 95 | 1.3 | 4.44 | 2.6 | 16 |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| (0) | - | - | - | - | - | - | - |
| (0) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .7 | 12 | 2.2 | (0) | .01 | .09 | .5 | 8 |
| 2.7 | 91 | .0 | 15,000 | (0) | (0) | (0) | (0) |
| 734.3 | 4,050.2 | 110.1 | 44,823 | 12,263 | 11.531 | 80.987 | 24 |
| 3.9 | 21.9 | .57 | 241.8 | .066 | .063 | .438 | .12 |
| .28 | 10.8 | .11 | (0) | .011 | .008 | .090 | 1.5 |
| 22.50 | 312.5 | (8.75) | 20,500 | .812 | .500 | 5.00 | 156.2 |
| 11.47 | 261.4 | 11.47 | 4,653.7 | .318 | .318 | 10.20 | 57.4 |
| 21.60 | 144 | 10.80 | 7,800 | .780 | .840 | 13.20 | 174 |
| 160.13 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 215.67 | 717.9 | 31.02 | 32,953.7 | 1.910 | 1.658 | 28.40 | 387.6 |
| 2.07 | 6.9 | .297 | 315.9 | .018 | .015 | .273 | 3.6 |
| 7.9 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |
| 53.5 | 775.6 | 20.44 | 6,496 | 4.704 | 1.064 | 14.560 | 2,808 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 53.5 | 775.6 | 20.44 | 6,496 | 4.704 | 1.064 | 14.560 | 2,808 |
| .57 | 8.4 | .21 | 69.6 | .051 | .012 | .156 | 30 |

Table 19 (Conti

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| School 223 | | | | | |
| Spaghetti and Tomatoes | | | | | |
| Spaghetti | 4 | $1.08 | $ - | 6,848 | 232.4 |
| Tomatoes, canned | 14 | - | 1.76 | 1,204 | 63 |
| Butter | .5 | .32 | - | 1,626 | 1.35 |
| Total | 18 | 1.40 | 1.76 | 9,678 | 296.75 |
| Portion, 2 oz. | | .009 | .012 | 67.2 | 2.06 |
| Cheese | | | | | |
| Cheese, cheddar | 10 | - | 4.20 | | |
| Portion, 1 oz. | | - | .028 | 104.9 | 6.58 |
| Green Beans | | | | | |
| Green Beans, canned | 37.875 | 6.32 | - | 3,143.6 | 170.40 |
| Butter | .5 | .32 | - | 1,626 | 1.35 |
| Total | 37 | 6.62 | - | 4,769.6 | 171.75 |
| Portion, 4 oz. | | .044 | - | 32.4 | 1.16 |
| Cabbage | | | | | |
| Cabbage | 7 | .21 | - | | |
| Portion, .67 oz. | | .001 | - | 4.5 | .26 |
| Bread and Peanut Butter Sandwich | | | | | |
| Bread, enriched | 17.5 | 2.64 | - | 21,822 | 675.5 |
| Butter | 2 | 1.28 | - | 6,502 | 5.40 |
| Peanut Butter | 3 | - | .90 | 7,845 | 355.5 |
| Total | 25 | 3.92 | .90 | 36,169 | 1,036.4 |
| Portion, 2 oz. | | .020 | .004 | 180.8 | 5.18 |
| Fruit Gelatin | | | | | |
| Gelatin Dessert Powder | 2.75 | .90 | - | 4,743.7 | 117.4 |
| Fruit Cocktail | 3.8 | .50 | - | 1,204.6 | 6.8 |
| Apples | 2 | .07 | - | 464 | 2.4 |
| Bananas | 2 | .30 | - | 538 | 7.2 |
| Total | 16.5 | 1.77 | - | 6,950.3 | 133.8 |
| Portion, 2 oz. | | .012 | - | 52.86 | 1.02 |

le 19 (Continued)

| Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| 232.4 | 400 | 27.2 | (0) | 1.68 | 1.08 | 36.8 | (0) |
| 63 | (700) | (37.8) | 66,780 | 3.50 | 2.10 | 44.8 | 1,050 |
| 1.35 | 46 | 0 | 7,500 | .050 | .025 | .250 | 0 |
| 296.75 | 1,146 | 65 | 74,280 | 5.230 | 3.205 | 81.850 | 1,050 |
| 2.06 | 8 | .46 | 505.8 | .036 | .22 | .568 | 7.2 |
| 6.58 | 191 | .26 | 368.7 | .004 | .116 | (.006) | (0) |
| 170.40 | 4,658.6 | 242.4 | 71,205 | 5.681 | 7.196 | 49.237 | 681.7 |
| 1.35 | 46 | 0 | 7,500 | .050 | .025 | .250 | 0 |
| 171.75 | 4,704.6 | 242.4 | 78,705 | 5.731 | 7.221 | 49.487 | 681.7 |
| 1.16 | 31.6 | 1.6 | 531.6 | .036 | .048 | .344 | 4.4 |
| .26 | 8.6 | .09 | 15.3 | .011 | .010 | .057 | 9.4 |
| 675.5 | 6,282.5 | 140 | 0 | 19.25 | 12.25 | 175 | 0 |
| 5.40 | 182 | 0 | 30,000 | .02 | .10 | 1. | 0 |
| 355.5 | 1,008 | 25.8 | 0 | 1.62 | 1.80 | 220.5 | (0) |
| 1,036.4 | 7,472.5 | 165.8 | 30,000 | 20.89 | 14.15 | 396.5 | 0 |
| 5.18 | 37.4 | .82 | 150 | .104 | .07 | 1.98 | 0 |
| 117.4 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 6.8 | 155.8 | 6.8 | 2,774 | .190 | .190 | 6.08 | 34.2 |
| 2.4 | 48 | 2.4 | 720 | .32 | .24 | 1.4 | 36 |
| 7.2 | 48 | 3.6 | 2,600 | .26 | .28 | 4.4 | 58 |
| 133.8 | 251.8 | 12.8 | 6,094 | .77 | .71 | 11.88 | 128.2 |
| 1.02 | 1.92 | .1 | 46.4 | .006 | .006 | .090 | .98 |

Table 19 (

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Prot Gm |
|---|---|---|---|---|---|
| Milk | | | | | |
| Portion, 8 oz. | | $ .05 | $ - | 155 | 7 |
| Grapefruit Juice | | | | | |
| Grapefruit Juice, canned, unsweetened | 34.5 | - | 3.07 | | |
| Portion, 3 oz. | | - | .018 | 32.45 | |
| School 231 | | | | | |
| Creamed Turkey | | | | | |
| Turkey, E.P. | 8.75 | 10.32 | - | 21,597.5 | 1,619 |
| Milk | 16 | 1.36 | - | 4,944 | 254 |
| Flour, enriched | 1 | .067 | - | 1,654 | 47 |
| Butter | .5 | .31 | - | 1,626 | 1 |
| Total | 16.5 | 12.06 | - | 29,821.5 | 1,922 |
| Portion, 2 oz. | | .09 | - | 225.8 | 14 |
| Mashed Potatoes | | | | | |
| Potatoes | 60 | - | 1.95 | 13,080 | 426 |
| Milk, dried, non fat | 1 | - | .14 | 1,643 | 163 |
| Butter | .5 | .62 | - | 1,626 | 1 |
| Total | 45 | .62 | 2.09 | 16,349 | 589 |
| Portion, 3 oz. | | .002 | .008 | 68.1 | 2 |
| Cabbage and Carrot Salad | | | | | |
| Cabbage | 9.5 | .38 | - | 760 | 4 |
| Carrots | 5 | .50 | - | 830 | 2 |
| Salad Dressing | 4 | .78 | .42 | 3,263 | 8 |
| Total | 14.5 | 1.06 | .42 | 4,853 | 15 |
| Portion, 2 oz. | | .009 | .003 | 41.8 | |

Table 19 (Continued)

| od rgy l. | Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|---|
| 55 | 7.95 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |
| 32.45 | .43 | 6.8 | .26 | 7.5 | .026 | .015 | .15 | 29.8 |
| 97.5 | 1,619.1 | 1,855 | 307.4 | Tr. | 6.89 | 11.395 | 643.95 | (0) |
| 44 | 254.4 | 8,576 | 4.8 | (11,520) | 2,560 | 12.480 | 8 | 96 |
| 54 | 47.7 | 73 | 13 | (0) | 2 | 1.20 | 16 | (0) |
| 26 | 1.4 | 46 | 0 | 7,500 | .005 | .025 | .25 | 0 |
| 21.5 | 1,922.6 | 10,550 | 325.2 | 19,020 | 11.455 | 25.100 | 668.20 | 96 |
| 25.8 | 14.56 | 79.8 | 2.46 | 144 | .086 | .190 | 5.06 | .8 |
| 80 | 426 | 2,520 | 162 | 4,200 | 24 | 9 | 264 | 3,840 |
| 43 | 161.6 | 5,902 | 2.6 | (190) | 1.60 | 8.88 | 5.2 | 32 |
| 26 | 1.4 | 46 | .0 | 7,500 | .005 | .025 | .25 | 0 |
| 49 | 589 | 8,468 | 164.6 | 11,890 | 25.605 | 17.905 | 269.45 | 3,872 |
| 68.1 | 2.46 | 35.4 | .69 | 49.5 | .108 | .075 | 1.11 | 16.2 |
| 60 | 43.7 | 1,444 | 16.1 | 2,565 | 1.90 | 1.615 | 9.5 | 1,567.5 |
| 30 | 24 | 780 | 16 | 240,000 | 1.10 | 1.10 | 12 | 120 |
| 63 | 84.5 | 330 | 19.7 | 5,324 | 1.23 | 1.95 | 6.3 | 0 |
| 53 | 152.2 | 2,554 | 51.8 | 247,889 | 4.23 | 4.665 | 27.8 | 1,687.5 |
| 41.8 | 1.32 | 22 | .44 | 2,136 | .036 | .040 | .24 | 14.6 |

Table 19 (Cont

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Peanut Butter Sandwich | | | | | |
| Bread, enriched | 3.25 | $ .90 | $ - | 4,052.7 | 125.45 |
| Bread, whole wheat | 3.25 | | | 3,545.7 | 131.75 |
| Peanut Butter | 3.5 | - | 1.05 | 9,152.5 | 414.75 |
| Margarine | 1.25 | .45 | - | 4,086.2 | 3.37 |
| Milk | .5 | .0475 | - | 156 | 7.95 |
| Total | 11 | 1.40 | 1.05 | 20,993.1 | 683.27 |
| Portion, 1.5 oz. | | .012 | .009 | 178.9 | 5.82 |
| Apple | | | | | |
| Apples | 15 | .99 | - | | |
| Portion, 2 oz. | | .008 | - | 29 | .15 |
| Milk | | | | | |
| Portion, 8 oz. | | .0475 | - | 155 | 7.95 |
| Salad Dressing | | | | | |
| Eggs, dried | .6275 | - | .84 | 1,687.3 | 133.3 |
| Vinegar | 2 | .12 | - | 102 | 0 |
| Sugar | 2 | .19 | - | 3,496 | (0) |
| Flour | .75 | .04 | - | 1,240.5 | 35.8 |
| Salt | - | .01 | - | - | - |
| Mustard | - | | - | - | - |
| Total | 8 | .36 | .84 | 6,525.8 | 169.1 |
| School 232 | | | | | |
| Baked Beans | | | | | |
| Beans, dried, Navy | 7 | .91 | - | 10,759 | 680.4 |
| Bacon | 1 | .95 | - | 2,857 | 41.3 |
| Onion | 1 | .01 | - | 193 | 6 |
| Syrup | .5 | .045 | - | 650 | (0) |
| Sugar, brown | .5 | .045 | - | 839 | (0) |
| Tomato Juice | 3 | .225 | - | 279 | 13.5 |
| Total | 18.75 | 2.19 | - | 115,577 | 741.2 |
| Portion, 3 oz. | | .02 | - | 155.7 | 7.41 |

le 19 (Continued)

| Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|
| Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 125.45 | 1,166.7 | 26 | 0 | 3.575 | 2.275 | 32.5 | 0 |
| 131.75 | 1,417 | 32.50 | 0 | 4.355 | 1.917 | 43.55 | 0 |
| 414.75 | 1,176 | 30.10 | 0 | 1.890 | 2.100 | 257.2 | (0) |
| 3.37 | 113.7 | 0 | 18,750 | (0) | (0) | (0) | (0) |
| 7.95 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |
| 683.27 | 4,141.4 | 88.75 | 19,110 | 9.900 | 6.682 | 333.50 | 3 |
| 5.82 | 35.2 | .75 | 162.9 | .084 | .057 | 2.83 | .03 |
| .15 | 3 | .15 | 45 | .02 | .015 | .09 | 2.2 |
| 7.95 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |
| 133.3 | 541.5 | 25.1 | 10,648.6 | .953 | 3.005 | .690 | 0 |
| 0 | 64 | 4.6 | - | - | - | - | - |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 35.8 | 54.7 | 9.75 | (0) | 1.500 | .900 | 12. | (0) |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 169.1 | 660.2 | 39.45 | 10,648.6 | 2.453 | 3.905 | 12.690 | 0 |
| 680.4 | 5,180 | 219.1 | 0 | 21.42 | 7.28 | 69.3 | 56 |
| 41.3 | 59 | 3.6 | (0) | 1.73 | .54 | 8.7 | 0 |
| 6 | 137 | 2.1 | 2.10 | .14 | .15 | .9 | 38 |
| (0) | 105 | 9.3 | 0 | 0 | .025 | .25 | (0) |
| (0) | 173 | 5.9 | (0) | (0) | (0) | (0) | (0) |
| 13.5 | 96 | 5.4 | 14,310 | .69 | .39 | 10.5 | 216 |
| 741.2 | 5,750 | 245.4 | 14,520 | 23.98 | 8.39 | 89.95 | 310 |
| 7.41 | 57.6 | 2.4 | 145.2 | .237 | .084 | .87 | 3 |

Table 19 (Contin

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Cabbage and Carrot Salad | | | | | |
| Carrots | 3 | $ .15 | $ - | 498 | 14.4 |
| Cabbage | 6.5 | .195 | - | 520 | 29.9 |
| Salad Dressing | 1 | .145 | - | 1,743 | 5 |
| Orange Juice, canned concentrate | .063 | - | .03 | 65.5 | 1.20 |
| Total | 9 | .49 | .03 | 2,826.5 | 50.50 |
| Portion, 1.5 oz. | | .005 | .0003 | 29.2 | .52 |
| Peanut Butter and Honey Sandwich | | | | | |
| Bread, enriched | 5 | .56 | - | 6,235 | 193 |
| Bread, whole wheat | 5 | .56 | - | 5,455 | 211 |
| Honey | 3 | - | .17 | 3,999 | 4.2 |
| Butter | 1 | .64 | - | 325 | 2.7 |
| Peanut Butter | 3 | - | .90 | 7,845 | 355.5 |
| Total | 15 | 1.76 | 1.07 | 26,785 | 766.4 |
| Portion, 2.5 oz. | | .018 | .01 | 279 | 8 |
| Banana Custard | | | | | |
| Bananas | 3 | .51 | - | 807 | 10.8 |
| Oranges | 3 | .22 | - | 441 | 8.7 |
| Eggs | .56 | .32 | - | 366.8 | 28.9 |
| Milk | 10 | .65 | - | 3,090 | 159 |
| Sugar | 2.5 | .25 | - | 4,370 | (0) |
| Flour, enriched | .125 | .0075 | - | 206.7 | 5.9 |
| Cornstarch | .125 | .0064 | - | 205.5 | .3 |
| Eggs, dried | .5 | - | .67 | 1,345 | 106.3 |
| Total | 12.5 | 1.96 | .67 | 10,832 | 319.9 |
| Portion, 2 oz. | | .020 | .007 | 108.4 | 3.20 |
| Milk | | | | | |
| Portion, 8 oz. | | .037 | - | 155 | 7.95 |
| Orange Juice | | | | | |
| Orange Juice, canned, concentrate | 2 | - | .90 | 2,078 | 38.2 |
| Grapefruit Juice, canned, unsweetened | 11.5 | - | 1. | 1,978 | 26.4 |
| Total | 32.5 | - | 1.90 | 4,056 | 64.6 |
| Portion, 5 oz. | | - | .024 | 48 | .75 |

le 19 (Continued)

| Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| 14.4 | 468 | 9.6 | 144,000 | .66 | .66 | 7.2 | 72 |
| 29.9 | 988 | 11.05 | 1,755 | 1.30 | 1.105 | 6.5 | 1,072.5 |
| 5 | 41 | 1.8 | 660 | .07 | .14 | (0) | 0 |
| 1.20 | 17.4 | .459 | 146.2 | .105 | .024 | .328 | 63.2 |
| 50.50 | 1,514.4 | 22.909 | 144,561.2 | 2.135 | 1.929 | 14.028 | 1,207.7 |
| .52 | 15.6 | .235 | 1,495.3 | .022 | .019 | .145 | 12.4 |
| 193 | 1,795 | 40 | 0 | 5.5 | 3.50 | 50 | 0 |
| 211 | 2,180 | 50 | 0 | 6.70 | 2.95 | 67 | 0 |
| 4.2 | 69 | 12.3 | (0) | .06 | .51 | 3 | 48 |
| 2.7 | 91 | .0 | 15,000 | .01 | .05 | .5 | 0 |
| 355.5 | 908 | 25.8 | 0 | 1.62 | 1.80 | 220.5 | (0) |
| 766.4 | 5,043 | 128.1 | 15,000 | 13.89 | 8.81 | 341 | 48 |
| 8 | 52.5 | 1.32 | 156.2 | .145 | .092 | 3.55 | .5 |
| 10.8 | 72 | 5.4 | 3,900 | .39 | .42 | 6.6 | 87 |
| 8.7 | 324 | 3.9 | (1,860) | .75 | .27 | 2.4 | 486 |
| 28.9 | 122.1 | 6.1 | 2,570 | .218 | .655 | .168 | 0 |
| 159 | 5,360 | 3 | (7,200) | 1.60 | 7.800 | 5 | 60 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 5.9 | 9.1 | 1.75 | (0) | .250 | .150 | 2.000 | (0) |
| .3 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 106.3 | 432 | 20 | 8,485 | .76 | 2.39 | .55 | 0 |
| 319.9 | 6,319.2 | 40.15 | 24,015 | 3.968 | 11.685 | 16.718 | 633 |
| 3.20 | 63.2 | .40 | 240.2 | .04 | .116 | .168 | 6.4 |
| 7.95 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |
| 38.2 | 554 | 14.6 | 4,640 | 3.36 | .76 | 10.4 | 2,006 |
| 26.4 | 414 | 16.1 | 460 | 1.61 | .920 | 9.2 | 1,817 |
| 64.6 | 968 | 30.7 | 5,100 | 4.97 | 1.680 | 19.6 | 3,823 |
| .75 | 11.5 | .35 | 60 | .060 | .02 | .230 | 45 |

Table 19 (Cont

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| School 233 | | | | | |
| Creamed Potatoes | | | | | |
| Potatoes, A.P. | 65 | $ - | $ 2.05 | 20,670 | 494 |
| Cream | 4 | 1.70 | - | 3,700 | 52.8 |
| Butter | 1.5 | 1.02 | - | 4,877 | 4.1 |
| Milk | 6 | .51 | - | 1,854 | 95.4 |
| Flour, white, enriched | 1 | .065 | - | 1,656 | 47.7 |
| Total | 46.875 | 3.29 | 2.05 | 32,757 | 694 |
| Portion, 4 oz. | | .017 | .001 | 174.8 | 3.68 |
| Spam | | | | | |
| Spam | 18.75 | 14.25 | - | 24,562.5 | 1,267.5 |
| Sugar, brown | 2 | .18 | - | 3,356 | (0) |
| Mustard | .063 | .005 | - | - | - |
| Vinegar | .5 | .024 | - | 28 | 0 |
| Total | 15.627 | 14.46 | - | 27,946.5 | 1,267.5 |
| Portion, 1 oz. | | .058 | - | 111.8 | 5.07 |
| Carrots, Raw | | | | | |
| Carrots, A.P. | 9 | .90 | - | | |
| Portion, .5 oz. | | .005 | - | 6 | .2 |
| Peanut Butter, Margarine Sandwich | | | | | |
| Bread, enriched | 12 | 2.04 | - | 14,964 | 463.2 |
| Bread | 6 | 1.02 | - | 6,546 | 253.2 |
| Butter | 2 | 1.36 | - | 6,502 | 5.4 |
| Peanut Butter | 6 | - | 1.92 | 12,690 | 611 |
| Total | 24.5 | 4.42 | 1.92 | 40,702 | 1,332.8 |
| Portion, 1.5 oz. | | .018 | .007 | 155.7 | 5.1 |
| Pears | | | | | |
| Pears, canned | 31.875 | 8.64 | - | | |
| Portion, 2 oz. | | .035 | - | 38.5 | .1 |

| Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|
| Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 494 | 2,730 | 175.5 | 4,550 | 26 | 9.75 | 286 | 4,160 |
| 52.8 | 1,760 | 1.2 | 14,000 | .42 | 1.92 | 1.2 | 15 |
| 4.1 | 137 | 0 | 22,500 | .015 | .075 | .75 | 0 |
| 95.4 | 3,216 | 1.8 | (4,320) | .96 | 4.68 | 3 | 36 |
| 47.7 | 73 | 13 | (0) | 2 | 1.2 | 16 | (0) |
| 694 | 7,916 | 191.5 | 45,370 | 29.395 | 17.625 | 306.95 | 4,211 |
| 3.68 | 42 | 1 | 242 | .156 | .092 | 1.64 | 22.4 |
| 1,267.5 | 768.75 | 187.5 | (0) | 27 | 18.75 | 234.375 | 0 |
| (0) | 690 | 23.6 | (0) | (0) | (0) | (0) | (0) |
| - | - | - | - | - | - | - | - |
| 0 | 16 | 1.65 | - | - | - | - | - |
| 1,267.5 | 1,474.75 | 212.75 | (0) | 27 | 18.75 | 234.375 | (0) |
| 5.07 | 5.90 | .85 | 0 | .11 | .075 | .037 | (0) |
| .2 | 6 | .11 | 1,714 | .01 | .01 | .09 | .9 |
| 463.2 | 4,308 | 96 | 0 | 13.20 | 8.40 | 120 | 0 |
| 253.2 | 2,616 | 60 | 0 | 8.04 | 3.54 | 80.4 | 0 |
| 5.4 | 182 | .0 | 30,000 | .02 | .10 | 1 | 12 |
| 611 | 2,016 | 51.6 | 0 | 3.24 | 3.60 | 4,410 | (0) |
| 1,332.8 | 9,122 | 207.6 | 30,000 | 24.50 | 15.64 | 642.4 | 12 |
| 5.1 | 34.9 | .79 | 114.7 | .09 | .058 | 2.4 | .04 |
| .1 | 4.5 | .1 | 2.5 | .005 | .01 | .075 | 1. |

Table 19 (Conti

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Spice Cake | | | | | |
| Spice Cake Mix[a] | 11.65 | $ 4.18 | $ - | 37,064 | 421.2 |
| Sugar, powdered | 2 | .20 | - | 3,496 | (0) |
| Milk | .5 | 1.06 | - | 1,545 | 74.5 |
| Walnut Meats | 2 | - | 1.58 | 5,944 | 136.2 |
| Total | 33.75 | 5.44 | 1.58 | 48,049 | 631.9 |
| Portion, 2.5 oz. | | .025 | .007 | 222.5 | 2.95 |
| Milk | | | | | |
| Portion, 8 oz. | | .045 | - | 155 | 7.95 |
| Orange and Grapefruit Juice | | | | | |
| Grapefruit Juice, canned, unsweetened | 11.5 | - | 1. | 1,978 | 26.4 |
| Orange Juice, canned, concentrate | 8 | - | 3.53 | 8,317 | 152.8 |
| Sugar | 1 | .095 | - | 1,748 | (0) |
| Total (108 oz.) | 66 | .10 | 4.53 | 12,043 | 179.2 |
| Portion, 5 oz. | | .0004 | .019 | 55.5 | .85 |
| Spice Cake Mix (Equivalent to 1 Box Commercial Cake Mix) | | | | | |
| Flour, enriched | .5 | | | 827 | 23.9 |
| Baking Powder | .03 | | | - | - |
| Cream Tartar | .03 | | | - | - |
| Salt | | | | - | - |
| Lard | .25 | | | 1,024 | 0 |
| Sugar | .75 | | | 1,311 | 0 |
| Eggs, dried | .0625 | | | 168.1 | 13.3 |
| Vanilla | .01 | | | - | - |
| Cinnamon | .01 | | | - | - |
| Nutmeg | .01 | | | - | - |
| Cocoa | .03 | | | 39.4 | 1.09 |
| Total | 1.6 | | | 3,369.5 | 38.29 |
| Portion | 11.65 | | | 37,064 | 421.2 |

[a]Nutritive content of commercial mix not available, values estimated from corresp
Mimeographed.

ble 19 (Continued)

| Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|
| Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 421.2 | 1,187 | 116.4 | 11,706 | 12.221 | 10.461 | 92.2 | (0) |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 74.5 | 2,680 | 1.5 | (3,600) | .80 | 3.90 | 2. | 30 |
| 136.2 | 754 | 19 | 320 | 4.34 | 1.20 | 10.8 | 26 |
| 631.9 | 4,621 | 136.9 | 15,626 | 17.361 | 15.561 | 105 | 56 |
| 2.95 | 21.5 | .62 | 72.2 | .080 | .072 | .47 | 2.5 |
| 7.95 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |
| 26.4 | 414 | 16.1 | 460 | 1.61 | .92 | 9.2 | 1,817 |
| 152.8 | 2,216 | 58.4 | 18,560 | 13.44 | 3.04 | 41.6 | 8,024 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 179.2 | 2,630 | 74.5 | 19,020 | 15.05 | 3.96 | 50.8 | 9,841 |
| .85 | 12. | .35 | 88 | .070 | .020 | .25 | 45.5 |
| 23.9 | 37 | 6.5 | (0) | 1 | .6 | 8. | (0) |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | - | - | (0) | (0) | (0) | (0) | (0) |
| 13.3 | 53.9 | 2.5 | 1,060.6 | .095 | .299 | .068 | 0 |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 1.09 | 17 | 1.58 | 3.6 | .016 | .052 | .312 | (0) |
| 38.29 | 107.9 | 10.58 | 1,064.2 | 1.111 | .951 | 8.380 | (0) |
| 421.2 | 1,187 | 116.4 | 11,706 | 12.221 | 10.461 | 92.2 | (0) |

om corresponding weight of a master mix. Iowa State College, Small Quantity Master Mix.

Table 19 (Co

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protei Gm. |
|---|---|---|---|---|---|
| School 234 | | | | | |
| Navy Beans | | | | | |
| Beans, Navy, dried | 25 | $ 3.75 | $ - | 38,425 | 2,430 |
| Butter | 3 | 2.04 | - | 9,753 | 8 |
| Molasses | 4 | .55 | - | 4,216 | - |
| Sugar, brown | 3 | .27 | - | 5,034 | (0 |
| Total | 74.8 | 6.61 | - | 57,428 | 2,438 |
| Portion, 4 oz. | | .022 | - | 192.8 | 8 |
| Hard Cooked Egg | | | | | |
| Eggs | 8.25 | 4.92 | - | | |
| Portion, .5 oz. | | .019 | - | 22.6 | 1 |
| Salad Dressing | | | | | |
| Salad Dressing | 2 | .43 | - | | |
| Portion, .1 oz. | | .002 | - | 10.9 | |
| Cheese | | | | | |
| Cheese, cheddar | 15 | - | 7.50 | | |
| Portion, 1 oz. | | - | .03 | 105 | 6 |
| Carrot Sticks | | | | | |
| Carrots, A.P. | | 1.76 | - | | |
| Portion, 1 oz. | | .007 | - | 12 | |
| Peanut Butter Sandwich | | | | | |
| Bread, enriched | 24.875 | 3.01 | - | 31,019 | 960 |
| Butter | 3 | 2.04 | - | 9,753 | 8 |
| Peanut Butter | 9 | - | 2.61 | 23,535 | 1,066 |
| Total | 37.875 | 5.05 | 2.61 | 64,307 | 2,034 |
| Portion, 2 oz. | | .014 | .009 | 179.6 | 5 |

19 (Continued)

| Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| 2,430 | 18,500 | 782.5 | 0 | 76.50 | 26 | 247.5 | 200 |
| 8.1 | 273 | .0 | 45,000 | .03 | .15 | 1.5 | 0 |
| - | 5,268 | 108.2 | - | - | - | - | - |
| (0) | 1,035 | 35.4 | (0) | (0) | (0) | (0) | (0) |
| 2,438.1 | 25,076 | 926.1 | 45,000 | 76.53 | 26.15 | 249 | 200 |
| 8.16 | 84 | 3.12 | 150.8 | .256 | .088 | .84 | .68 |
| 1.8 | 7.5 | .4 | 158.2 | .013 | .04 | .01 | 0 |
| .03 | .23 | .011 | 4.1 | Tr. | .001 | (0) | 0 |
| 6.6 | 191 | .26 | (369) | .004 | .116 | ( .006) | (0) |
| .3 | 11 | .23 | 3,428 | .016 | .016 | .172 | 1.72 |
| 960.1 | 8,930 | 199 | 0 | 27.36 | 17.41 | 248.7 | 0 |
| 8.1 | 273 | .0 | 45,000 | .03 | .15 | 1.5 | 0 |
| 1,066 | 3,024 | 77.4 | 0 | 4.86 | 5.40 | 661.5 | (0) |
| 2,034.2 | 12,227 | 276.4 | 45,000 | 32.25 | 22.96 | 991.7 | 0 |
| 5.6 | 34.2 | .78 | 125.6 | .090 | .064 | 2.54 | 0 |

Table 19 (Conti

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Applesauce | | | | | |
| Applesauce, canned | 52.5 | $ - | $ 6.30 | 17,272 | 47.25 |
| Sugar | 3 | .285 | - | 5,244 | (0) |
| Cinnamon | .187 | .15 | - | - | - |
| Total | | .44 | 6.30 | 22,516 | 47.25 |
| Portion, 3 oz. | | .007 | .022 | 78.3 | .165 |
| Milk | | | | | |
| Portion, 6 oz. | | .04 | - | 116 | 5.9 |
| Orange Juice | | | | | |
| Sugar | 3 | .285 | - | 5,244 | (0) |
| Orange Juice, canned, concentrate | 8.627 | - | 1.19 | 8,963 | 164.8 |
| Total | 68 | .29 | 1.19 | 14,207 | 164.8 |
| Portion, 4 oz. | | .001 | .004 | 51.6 | .60 |
| School 235 | | | | | |
| Baked Beef Hash | | | | | |
| Beef, chuck | 30 | 9 | 2.25 | 30,570 | 2,532 |
| Potatoes, A.P. | 75 | - | - | 23,850 | 570 |
| Onions | 2 | .04 | - | 386 | 12 |
| Total | 70 | 9.04 | 2.25 | 54,806 | 3,114 |
| Portion, 5 oz. | | .041 | .01 | 244.65 | 13.90 |
| Breaded Tomatoes | | | | | |
| Tomatoes, canned | 19.125 | - | 2.28 | 1,644.7 | 86.06 |
| Bread, enriched | 3.75 | .51 | - | 4,676.2 | 144.75 |
| Total | 21.75 | .51 | 2.28 | 6,320.9 | 230.81 |
| Portion, 1.5 oz. | | .003 | .023 | 27.36 | .99 |
| Carrot Sticks | | | | | |
| Carrots | 15 | 1.20 | - | | |
| Portion, 1 oz. | | .006 | - | 12 | .3 |

able 19 (Continued)

| y | Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|---|
| | 47.25 | 945 | 94.5 | 7,875 | 4.725 | 2.625 | 10.50 | 262.5 |
| | (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| | - | - | - | - | - | - | - | - |
| | 47.25 | 945 | 94.5 | 7,875 | 4.725 | 2.625 | 10.50 | 262.5 |
| .3 | .165 | 3.3 | .33 | 27.3 | .015 | .009 | .03 | .9 |
| | 5.9 | 201 | .11 | (270) | .06 | .29 | .19 | 2.2 |
| | (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| | 164.8 | 2,390 | 62.98 | 20,015.8 | 14.49 | 3.278 | 44.86 | 8,653 |
| | 164.8 | 2,390 | 62.98 | 20,015.8 | 14.49 | 3.278 | 44.86 | 8,653 |
| .6 | .60 | 8.8 | .24 | 72.4 | .052 | .012 | .16 | 30.2 |
| | 2,532 | 1,500 | 381 | (0) | 10.80 | 22.50 | 606 | 0 |
| | 570 | 3,150 | 202.5 | 5,250 | 30 | 11.25 | 330 | 4,800 |
| | 12 | 274 | 4.2 | 420 | .28 | .30 | 1.8 | 76 |
| | 3,114 | 4,924 | 587.7 | 5,670 | 41.08 | 34.05 | 937.8 | 4,876 |
| .65 | 13.90 | 215.5 | 2.5 | 15.30 | .185 | .150 | 4.20 | 21.5 |
| .7 | 86.06 | (956.2) | (51.63) | 91,226.2 | 4.781 | 2.868 | 61.20 | 1,434.4 |
| .2 | 144.75 | 1,346.2 | 30 | 0 | 4.125 | 2.625 | 37.50 | 0 |
| .9 | 230.81 | 2,302.4 | 81.63 | 91,226.2 | 8.906 | 5.493 | 98.70 | 1,434.4 |
| .36 | .99 | 9.9 | .34 | 393.1 | .039 | .024 | .42 | 6.1 |
| | .3 | 11 | .23 | 3,428 | .02 | .02 | .2 | 2 |

Table 19 (Continu

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. | |
|---|---|---|---|---|---|---|
| Chocolate Pudding | | | | | | |
| Chocolate Pudding Mix[a] | 10 | $ 3.40 | $ - | | | |
| Milk | 15 | 1.35 | - | | | |
| Milk, dried | .5 | - | .07 | | | |
| Total | 38.125 | 4.76 | .07 | | | |
| Portion, 2.5 oz. | | .019 | .0003 | 117 | 2.2 | |
| Peanut Butter Sandwich | | | | | | |
| Bread, enriched | 8.75 | 1.19 | - | 10,911.2 | 337.75 | 3 |
| Bread, whole wheat | 7.5 | 1.02 | - | 8,182.5 | 316.50 | 3 |
| Margarine | 2 | 1.02 | - | 6,538 | 5.4 | |
| Butter | 1 | .71 | - | 3,251 | 2.7 | |
| Peanut Butter | 3 | - | .87 | 7,845 | 355.5 | 1 |
| Total | 22.5 | 3.94 | .87 | 36,727.7 | 1,017.85 | 7 |
| Portion, 1.25 oz. | | .013 | .003 | 127.5 | 3.54 | |
| Orange Juice | | | | | | |
| Orange Juice, canned, concentrate | 4 | - | 1.77 | 4,156 | 76.4 | 1 |
| Sugar | 1 | .09 | - | 1,748 | (0) | |
| Total | 32 | .09 | 1.77 | 5,904 | 76.4 | 1 |
| Portion, 2 oz. | | .0004 | .007 | 23 | .30 | |
| Milk | | | | | | |
| Portion, 8 oz. | | .045 | - | 155 | 7.95 | |
| School 236 | | | | | | |
| Cheese | | | | | | |
| Cheese, cheddar | 8.5 | - | 4.25 | | | |
| Portion, 1 oz. | | - | .031 | 105 | 6.6 | |

[a]Nutritive content of commercial chocolate pudding mix not available. Values adapted
commonly used. Philadelphia, Anna de Planter Bowes, 311 South Juniper Street. 6th

49 (Continued)

| Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| 2.2 | 72. | .1 | 87 | .047 | .216 | .16 | 0 |
| 337.75 | 3,141.2 | 70 | 0 | 9.625 | 6.125 | 87.50 | 0 |
| 316.50 | 3,270 | 75 | 0 | 10.050 | 4.425 | 100.50 | 0 |
| 5.4 | 182 | 0 | 30,000 | (0) | (0) | (0) | (0) |
| 2.7 | 91 | 0 | 15,000 | .01 | .05 | .5 | 0 |
| 355.5 | 1,008 | 25.8 | 0 | 1.62 | 1.80 | 220.5 | (0) |
| .,017.85 | 7,692.2 | 170.8 | 45,000 | 21.205 | 12.400 | 409 | 0 |
| 3.54 | 26.7 | .59 | 156.2 | .074 | .042 | 1.4 | 0 |
| 76.4 | 1,108 | 29.2 | (9,280) | 6.72 | 1.52 | 20.8 | 4,012 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 76.4 | 1,108 | 29.2 | 9,280 | 6.72 | 1.52 | 20.8 | 4,012 |
| .30 | 4.4 | .12 | 36.2 | .026 | .006 | .08 | 15.8 |
| 7.95 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |
| 6.6 | 191 | .26 | (369) | .004 | .116 | (.006) | (0) |

es adapted from Bowes, Anna de Planter and Church, Charles F. Food values of portions eet. 6th ed. c1946. Figures for chocolate pudding dessert used.

Table 19 (Conti

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Creamed Potatoes | | | | | |
| Milk | 18 | $ 1.62 | $ - | 5,562 | 286.2 |
| Potatoes, A.P. | 110 | - | 3.85 | 34,980 | 836 |
| Flour, enriched | 1 | .065 | - | 1,654 | 47.7 |
| Butter | 1 | .64 | - | 3,251 | 2.7 |
| Total | 102 | 2.33 | 3.85 | 45,447 | 1,172.6 |
| Portion, 3.67 oz. | | .005 | .008 | 102 | 2.64 |
| Gelatin Vegetable Salad | | | | | |
| Gelatin | .375 | .36 | - | 570 | 145.72 |
| Celery | 2 | .30 | - | 104 | 7.4 |
| Cabbage | 3 | .10 | - | 240 | 13.8 |
| Pineapple, Cn., Cr. | 6.5 | 1.21 | - | 2,307.5 | 11.7 |
| Carrots | .813 | .08 | - | 134.9 | 3.1 |
| Total | 24.75 | 2.05 | - | 3,356.4 | 181.72 |
| Portion, 2.67 oz. | | .014 | - | 22.7 | 1.23 |
| Bread and Butter | | | | | |
| Bread, enriched | 8.75 | .98 | - | 10,911.2 | 337.75 |
| Bread, whole wheat | 8.75 | .98 | - | 9,546.2 | 369.25 |
| Butter | 2 | 1.28 | - | 6,502 | 5.4 |
| Total (28 oz.) | 17.5 | 3.24 | - | 26,959.4 | 712.40 |
| Portion, 1 oz. | | .011 | - | 96.3 | 2.54 |
| Ginger Bread | | | | | |
| Lard | 1 | .48 | - | 4,095 | 0 |
| Sugar | 1.5 | .1425 | - | 2,622 | (0) |
| Molasses | 3.25 | .75 | - | 3,425.5 | - |
| Flour, enriched | 3.5 | .2275 | - | 5,789 | 166.95 |
| Eggs, dried | .375 | - | .504 | 1,008.4 | 79.69 |
| Cornstarch | .5 | .245 | - | 822 | 1.7 |
| Baking Powder | .063 | .01 | - | - | - |
| Salt | .03 | .001 | - | - | - |
| Cinnamon | .063 | .05 | - | - | - |
| Ginger | .063 | .03 | - | - | - |
| Soda | .063 | .003 | - | - | - |
| Total | 9.5 | 1.94 | .504 | 17,761.9 | 248.34 |
| Portion, 1 oz. | | .013 | .002 | 116.8 | 1.63 |
| Milk | | | | | |
| Portion, 8 oz. | | .045 | - | 155 | 7.95 |

ıle 19 (Continued)

| Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| 286.2 | 9,648 | 5.4 | (12,960) | 2.88 | 14.04 | 9 | 108 |
| 836 | 4,620 | 297 | 7,700 | 44 | 16.50 | 484 | 7,040 |
| 47.7 | 73 | 13 | (0) | 2 | 1.20 | 16 | (0) |
| 2.7 | 91 | 0 | 15,000 | .01 | .05 | .50 | 0 |
| 1,172.6 | 14,432 | 315.4 | 35,660 | 48.89 | 31.79 | 509.50 | 7,148 |
| 2.64 | 32.3 | .70 | 80 | .11 | .070 | 1.14 | 16.1 |
| 145.72 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 7.4 | 286 | 2.8 | 0 | .30 | .22 | 2.4 | 40 |
| 13.8 | 456 | 5.1 | 810 | .60 | .51 | 3 | 495 |
| 11.7 | 858 | 17.55 | 2,340 | 2.275 | .455 | 5.2 | 266.5 |
| 3.1 | 126.8 | 2.60 | 39,024 | .179 | .179 | 1.95 | 19.5 |
| 181.72 | 1,726.8 | 28.05 | 42,174 | 3.354 | 1.364 | 12.55 | 821 |
| 1.23 | 11.7 | .19 | 284.3 | .021 | .008 | .08 | 5.6 |
| 337.75 | 3,141.2 | 70 | 0 | 9.625 | 6.125 | 87.50 | 0 |
| 369.25 | 3,815 | 87.50 | 0 | 11.725 | 5.162 | 117.25 | 0 |
| 5.4 | 182 | 0 | 30,000 | .02 | .10 | 1. | 0 |
| 712.40 | 7,138.2 | 157.50 | 30,000 | 21.370 | 11.387 | 205.75 | 0 |
| 2.54 | 25.5 | .56 | 107.1 | .076 | .041 | .73 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| - | 4,280.2 | 88.4 | - | - | - | - | - |
| 166.95 | 255.5 | 45.5 | (0) | 7 | 4.200 | 56 | (0) |
| 79.69 | 323.6 | 16.9 | 6,363.7 | .570 | 1.796 | .412 | 0 |
| 1.7 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 248.34 | 4,859.3 | 150.8 | 6,363.7 | 7.570 | 5.996 | 56.412 | 0 |
| 1.63 | 32 | .99 | 41.9 | .050 | .039 | .371 | 0 |
| 7.95 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |

Table 19 (Continue

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. | C |
|---|---|---|---|---|---|---|
| School 237 | | | | | | |
| Macaroni and Cheese | | | | | | |
| Macaroni | 8 | $ 1.52 | $ - | 13,696 | 464.8 | |
| Milk, dried, non fat | .5 | - | .07 | 822 | 80.3 | 2 |
| Butter | 1.75 | 1.12 | - | 5,689.2 | 4.72 | |
| Cheese | 5 | - | 2.60 | 8,390 | 526.5 | 1 |
| Milk | 6 | .54 | - | 1,854 | 95.4 | |
| Lard | .187 | .07 | - | 765.8 | 0 | |
| Total | 34.5 | 3.25 | 2.67 | 31,217 | 1,171.72 | 2 |
| Portion, 4 oz. | | .023 | .019 | 226 | 8.48 | |
| Harvard Beets | | | | | | |
| Beets, canned | 16.25 | 1.95 | - | 2,486.2 | 66.62 | |
| Vinegar | 1 | .22 | - | 56 | 0 | |
| Butter | .063 | .04 | - | 203.2 | .17 | |
| Cornstarch | .125 | .06 | - | 205.5 | .29 | |
| Total | 17.125 | 2.27 | - | 2,950.9 | 67.08 | |
| Portion, 2 oz. | | .016 | - | 21.6 | .48 | |
| Peanut Butter and Fruit Sandwich | | | | | | |
| Bread, white, enriched | 17 | 2.32 | - | 21,199 | 656.2 | |
| Peanut Butter | 4 | - | 1.24 | 10,460 | 474 | |
| Butter | 1 | .64 | - | 3,251 | 2.7 | |
| Margarine | 2 | .82 | - | 6,538 | 5.4 | |
| Apples, dried | 2 | - | .56 | 2,512 | 12.8 | |
| Raisins | 1 | - | .21 | 1,218 | 10.4 | |
| Mazola | .5 | .227 | - | 2,007 | 0 | |
| Total | 20.75 | 4.01 | 2.01 | 47,185 | 1,161.5 | |
| Portion, 1.5 oz. | | .018 | .009 | 213.1 | 5.2 | |
| Plums | | | | | | |
| Plums, canned | 20.63 | 2.75 | - | | | |
| Portion, 2.5 oz. | | .021 | - | 51.5 | .26 | |

19 (Continued)

| Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|
| Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 464.8 | 800 | 54.4 | (0) | 3.36 | 2.16 | 73.6 | (0) |
| 80.3 | 2,951 | 1.3 | (95) | .80 | 4.44 | 2.6 | 16 |
| 4.72 | 159 | 0 | 26,250 | .017 | .087 | .87 | 0 |
| 526.5 | 15,275 | 20.5 | (29,500) | .35 | 9.25 | (.5) | (0) |
| 95.4 | 3,216 | 1.8 | (4,320) | .96 | 4.68 | 3 | 36 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1,171.72 | 22,401 | 78 | 60,165 | 5.487 | 20.617 | 80.57 | 52 |
| 8.48 | 162.4 | .56 | 435.6 | .040 | .148 | .60 | .36 |
| 66.62 | 1,105 | 43.87 | 1,300 | .650 | 1.787 | 9.75 | 341.2 |
| 0 | 32 | 2.30 | - | - | - | - | - |
| .17 | 5.7 | 0 | 937.5 | .001 | .003 | .03 | 0 |
| .29 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 67.08 | 1,142.7 | 46.17 | 2,237.5 | .651 | 1.790 | 9.78 | 341.2 |
| .48 | 8.4 | .34 | 16.4 | .004 | .012 | .08 | 2.4 |
| 656.2 | 6,103 | 136 | 0 | 18.70 | 11.90 | 170 | 0 |
| 474 | 1,344 | 34.4 | 0 | 2.16 | 2.40 | 294 | (0) |
| 2.7 | 91 | 0 | 15,000 | .01 | .05 | .5 | 0 |
| 5.4 | 182 | 0 | 30,000 | (0) | (0) | (0) | (0) |
| 12.8 | 172 | 12.8 | (0) | .86 | .86 | 8.8 | 110 |
| 10.4 | 354 | 15 | 230 | .69 | .37 | 2.2 | Tr. |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1,161.5 | 8,246 | 198.2 | 45,230 | 22.42 | 15.58 | 475.5 | 110 |
| 5.2 | 37.2 | .9 | 204 | .100 | .070 | 2.1 | .45 |
| .26 | 5.5 | .75 | 154.7 | .019 | .017 | .25 | .78 |

Table 19 (Contin

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Frosted Graham Cracker | | | | | |
| Butter | .75 | $ .48 | $ - | 2,438.2 | 2.02 |
| Sugar, powdered | 3 | .30 | - | 5,244 | (0) |
| Vanilla | .03 | .0175 | - | - | - |
| Milk | .5 | .05 | - | 155 | 7.95 |
| Graham Crackers | 7 | 1.96 | - | 12,495 | 254.1 |
| Total | | 2.81 | - | 20,332.2 | 264.07 |
| Portion, 1 oz. | | .017 | - | 121 | 1.57 |
| Milk | | | | | |
| Portion, 8 oz. | | .05 | - | 155 | 7.95 |
| Orange Juice | | | | | |
| Orange Juice, canned, concentrate | 3.75 | - | 1.68 | 3,896.2 | 71.62 |
| Total | 28 | - | 1.68 | 3,896.2 | 71.62 |
| Portion, 3 oz. | | - | .012 | 27.9 | .51 |
| School 238 | | | | | |
| Creamed Chicken | | | | | |
| Chicken, hens | 25.75 | 9.02 | - | 28,273 | 1,681.5 |
| Flour | 4 | .26 | - | 6,616 | 190.8 |
| Milk, dried, non fat | 2 | - | .28 | 3,286 | 323.2 |
| Chicken Fat (from chickens) | 1 | - | - | - | - |
| Total | 37.8 | 9.28 | .28 | 38,175 | 2,195.5 |
| Portion, 2.5 oz. | | .037 | .001 | 159 | 9.15 |
| Mashed Potatoes | | | | | |
| Milk, dried, non fat | 5 | - | .07 | 821 | 80.8 |
| Potatoes, A.P. | 97 | - | 3.50 | 30,846 | 737.2 |
| Milk | 4 | .35 | - | 1,236 | 63.6 |
| Margarine | 1 | .35 | - | 3,269 | 2.7 |
| Total | 86 | .70 | 3.57 | 36,172 | 884.3 |
| Portion, 4 oz. | | .002 | .010 | 105.2 | 2.56 |
| Lima Beans, Dried, Canned | | | | | |
| Lima Beans | 25.25 | 4.80 | - | | |
| Portion, 2 oz. | | .024 | - | 40.1 | 2.2 |

) (Continued)

| :otein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| 2.02 | 68.25 | 0 | 11,250 | .007 | .037 | .37 | 0 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| - | - | - | - | - | - | - | - |
| 7.95 | 268 | .15 | 360 | .08 | .39 | .25 | 3 |
| 254.1 | 637 | 60.20 | (0) | 9.52 | 3.78 | 4.76 | 0 |
| 264.07 | 973.25 | 61.10 | 11,764.7 | 9.626 | 4.224 | 5.63 | .78 |
| 1.57 | 5.8 | .36 | 70 | .057 | .025 | .03 | .004 |
| 7.95 | 268 | .15 | 360 | .08 | .39 | .25 | 3 |
| 71.62 | 1,038.7 | 27.37 | (8,700) | 6.30 | 1,425 | 19.50 | 3,761 |
| 71.62 | 1,038.7 | 27.37 | (8,700) | 6.30 | 1.425 | 19.50 | 3,761 |
| .51 | 7.5 | .195 | 62.1 | .045 | .009 | .138 | 26.7 |
| ,681.5 | 1,313.2 | 139 | (0) | 7.725 | 15.192 | 751.9 | (0) |
| 190.8 | 292 | 42 | (0) | 8 | 4.80 | 64 | 0 |
| 323.2 | 11,804 | 5.2 | (380) | 3.20 | 17.76 | 10.4 | (0) |
| - | - | - | - | - | - | - | - |
| :,195.5 | 13,409.2 | 186.2 | 380 | 18.925 | 37.752 | 826.3 | 0 |
| 9.15 | 55.7 | .77 | 1.57 | .077 | .057 | 3.5 | 0 |
| 80.8 | 2,950 | 1.3 | (.95) | .80 | 4.44 | 2.6 | 16 |
| 737.2 | 4,074 | 261.9 | 6,790 | 38.80 | 14.55 | 426.8 | 6,208 |
| 63.6 | 2,144 | 1.2 | (2,880) | .64 | 3.12 | 2 | 24 |
| 2.7 | 91 | .0 | 15,000 | (0) | (0) | (0) | (0) |
| 884.3 | 9,259 | 264.4 | 24,765 | 40.24 | 22.11 | 431.4 | 6,248 |
| 2.56 | 26.8 | .76 | 72 | .116 | .064 | 1.24 | 18 |
| 2.2 | 15.4 | .96 | 73.7 | .02 | .025 | .31 | 4.5 |

Table 19 (Conti

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Parkerhouse Roll and Margarine | | | | | |
| Rolls, enriched | 15 | $ 3.40 | $ - | | |
| Portion, 1 oz. | | .014 | - | 87.9 | 2.6 |
| Margarine | 4 | 1.40 | - | | |
| Portion, .25 oz. | | .006 | - | 51.1 | .04 |
| Apple Crisp | | | | | |
| Apples, dried | 10 | - | 2.40 | 12,560 | 64 |
| Lemon Juice, canned | .25 | .09 | - | 27 | .45 |
| Sugar | 7.5 | .675 | - | 13,108 | (0) |
| Cinnamon | .03 | .045 | - | - | - |
| Flour | 2.5 | .1625 | - | 4,135 | 119.25 |
| Butter | 2 | 1.28 | - | 6,502 | 5.4 |
| Total | 53.5 | 2.24 | 2.40 | 36,332 | 189.10 |
| Portion, 4 oz. | | .010 | .011 | 169.6 | .88 |
| Milk | | | | | |
| Portion, 8 oz. | | .04 | - | 155 | 7.95 |
| Orange Juice | | | | | |
| Orange Juice, canned, concentrate | 6.3 | - | 1.93 | 6,545.7 | 120.3 |
| Total | 30 | - | 1.93 | 6,545.7 | 120.3 |
| Portion, 2 oz. | | - | .008 | 27.2 | .5 |
| School 239 - No Data | | | | | |
| School 2310 | | | | | |
| Meat Loaf | | | | | |
| Beef, ground chuck | 15 | 8.85 | - | 15,285 | 1,266 |
| Crackers, saltines | 5 | 1 | - | 9,775 | 209 |
| Tomato Juice | 6 | | .36 | 558 | 27 |
| Eggs, dried | .5 | - | .67 | 1,345 | 106.3 |
| Potatoes | 4.75 | - | .16 | 1,510.5 | 36.1 |
| Onions | 2 | .20 | - | 386 | 12 |
| Salt | .25 | .003 | - | - | - |
| Total | 28.125 | 10.05 | 1.19 | 28,859.5 | 1,656.4 |
| Portion, 3 oz. | | .067 | .008 | 192.3 | 11.04 |

19 (Continued)

| Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|
| Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 2.6 | 15.6 | .50 | 0 | .068 | .044 | .625 | (0) |
| .04 | 1.4 | 0 | 234.4 | (0) | (0) | (0) | (0) |
| 64 | 860 | 64 | (0) | 4.30 | 4.30 | 44 | 550 |
| .45 | 16 | .1 | 0 | .50 | .05 | .15 | 48 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| - | - | - | - | - | - | - | - |
| 119.25 | 182.5 | 32.5 | (0) | 5 | 3 | 40 | (0) |
| 5.4 | 182 | 0 | 30,000 | .02 | .10 | 1 | 0 |
| 189.10 | 1,240.5 | 96.6 | 30,000 | 9.82 | 7.45 | 85.15 | 598 |
| .88 | 5.6 | .44 | 140 | .044 | .036 | .396 | 2.8 |
| 7.95 | 268 | .15 | (360) | .08 | .39 | .25 | 3 |
| 120.3 | 1,745.1 | 45.99 | 14,616 | 10.58 | 2.392 | 32.76 | 6,318.9 |
| 120.3 | 1,745.1 | 45.99 | 14,616 | 10.58 | 2.392 | 32.76 | 6,318.9 |
| .5 | 7.2 | .18 | 60.8 | .044 | .010 | .136 | 26.4 |
| .266 | 750 | 190.5 | (0) | 5.40 | 11.25 | 303 | 0 |
| 209 | 430 | 22.5 | (0) | 1.40 | 1 | 23.5 | (0) |
| 27 | (192) | (10.8) | 28,620 | 1.38 | .78 | 21 | 432 |
| 106.3 | 431 | 20 | 8,485 | .76 | 2.39 | .5 | 0 |
| 36.1 | 199.5 | 12.82 | 332.5 | 1.90 | .71 | 20.9 | 304 |
| 12 | 274 | 4.2 | 420 | .28 | .30 | 1.8 | 76 |
| - | - | - | - | - | - | - | - |
| 656.4 | 2,276.5 | 260.82 | 37,857.5 | 11.12 | 16.43 | 370.7 | 812 |
| 11.04 | 15 | 1.74 | 252.3 | .075 | .108 | 2.46 | 5.4 |

Table 19 (Continue

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. | C |
|---|---|---|---|---|---|---|
| Creamed Peas | | | | | | |
| Peas, canned | 26.25 | $ 3.16 | $ - | 8,058.7 | 404.25 | |
| Flour, enriched | .8 | .039 | - | 1,323.2 | 38.2 | |
| Milk, evaporated | 2.187 | .25 | - | 675.9 | 34.78 | |
| Butter | .75 | .48 | - | 2,438.2 | 2.02 | |
| Total | 25.25 | 3.93 | - | 12,496 | 479.15 | |
| Portion, 2 oz. | | .019 | - | 61.8 | 2.4 | |
| Carrot Sticks | | | | | | |
| Carrots | 3 | .21 | - | | | |
| Portion, .25 oz. | | .001 | - | 2.91 | .08 | |
| Bread | | | | | | |
| Flour, enriched | 4 | .308 | - | 6,616 | 190.8 | |
| Flour, graham | 3 | .12 | - | 4,533 | 181.2 | |
| Lard | 1 | .25 | - | 4,095 | 0 | |
| Milk | 4 | .30 | - | 1,236 | 63.6 | |
| Salt | .125 | .001 | - | - | - | |
| Sugar | 1 | .09 | - | 1,748 | (0) | |
| Yeast | .627 | .256 | - | 243.5 | (30.18) | |
| Total | 13.125 | 1.33 | - | 18,471.5 | 465.78 | |
| Portion, 1 oz. | | .007 | - | 87.9 | 2.22 | |
| Margarine | | | | | | |
| Margarine | 2 | .90 | - | | | |
| Portion, .25 oz. | | .007 | - | 51.1 | .042 | |
| Peaches | | | | | | |
| Peaches, canned | 20.438 | 3.30 | - | | | |
| Portion, 2 oz. | | .022 | - | 38.5 | .22 | |

le 19 (Continued)

| Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|
| Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 404.25 | 2,992.5 | 215.25 | 64,837.5 | 13.39 | 7.35 | 123.37 | 1,023.7 |
| 38.2 | 58.4 | 10.4 | (0) | 1.60 | .96 | 12.80 | (0) |
| 34.78 | 1,172.5 | .67 | (1,575) | .35 | 1.71 | 1.09 | 13.1 |
| 2.02 | 68.2 | (0) | 11,250 | .007 | .037 | .375 | 0 |
| 479.15 | 4,291.6 | 226.32 | 77,662.5 | 15.347 | 10.057 | 137.635 | 1,036.8 |
| 2.4 | 21.2 | 1.02 | 384.4 | .076 | .050 | .68 | 5.2 |
| .08 | 2.73 | .056 | 842.1 | .004 | .004 | .042 | .42 |
| 190.8 | 292 | 52 | (0) | 8 | 4.8 | 64 | (0) |
| 181.2 | 558 | 45 | (0) | 7.47 | 1.62 | 59.1 | (0) |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 63.6 | 2,144 | 1.2 | 2,880 | .64 | 3.12 | 2 | 24 |
| - | - | - | - | - | - | - | - |
| (0) | - | - | (0) | (0) | (0) | ( 0) | (0) |
| (30.18) | 71.53 | 13.93 | (0) | 1.29 | 5.88 | 80.32 | (0) |
| 465.78 | 3,065.53 | 112.13 | 2,880 | 17.40 | 15.42 | 205.42 | 24 |
| 2.22 | 14.6 | .53 | 13.7 | .083 | .073 | .98 | .11 |
| .042 | 1.42 | 0 | 234.4 | (0) | (0) | (0) | (0) |
| .22 | 2.88 | .22 | 257.5 | .004 | .011 | .387 | 2.4 |

Table 19 (Continue

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Chocolate Ice Box Cooky | | | | | |
| Flour, cake | 1.125 | $ .086 | $ - | 1,859.6 | 38.25 |
| Sugar | .75 | .062 | - | 1,311 | (0) |
| Chocolate | .5 | .44 | - | 1,138 | (12.5) |
| Lard | .8 | .125 | - | 3,276 | 0 |
| Walnut Meats | .25 | - | .17 | 743 | 17.02 |
| Vanilla | .03 | .018 | - | - | - |
| Cinnamon | .01 | .018 | - | - | - |
| Eggs, dried | .0625 | - | .084 | 168.1 | 13.28 |
| Total | 3.8 | .74 | .254 | 8,495.7 | 81.05 |
| Portion, .5 oz. | | .006 | .002 | 75.8 | .72 |
| Milk | | | | | |
| Milk, raw | 48 | 3.60 | - | | |
| Portion, 6 oz. | | .028 | - | 115.7 | 5.95 |
| Orange and Grapefruit Juice | | | | | |
| Grapefruit Juice, canned, unsweetened | 2.875 | - | .26 | 494.5 | 6.61 |
| Orange Juice, canned, concentrate | 2.875 | - | 1.29 | 2,987.1 | 54.91 |
| Total | 26 | - | 1.55 | 3,481.6 | 61.52 |
| Portion, 3 oz. | | - | .011 | 25.2 | .45 |
| School 2311 | | | | | |
| Creole Spaghetti | | | | | |
| Beef, ground, chuck | 15 | 9.75 | - | 15,285 | 1,266 |
| Onions | .8 | .05 | - | 154.4 | 4.8 |
| Bacon | 1 | .35 | - | 2,857 | 41.3 |
| Spaghetti | 6 | 1.05 | - | 10,272 | 348.6 |
| Salt | .125 | .01 | - | - | - |
| Paprika | .313 | .02 | - | - | - |
| Pepper | .156 | .015 | - | - | - |
| Tomatoes, canned | 19.125 | - | 2.37 | 1,644.7 | 86.1 |
| Pimiento, canned | .25 | .17 | - | 30.7 | 1.02 |
| Cheese, cheddar, processed | 2.8 | - | .75 | 4,698.4 | 294.84 |
| Green Pepper | .25 | .04 | - | 2.37 | 1.15 |
| Total | 28.125 | 11.46 | 3.12 | 34,044.6 | 2,043.81 |
| Portion, 3 oz. | | .076 | .030 | 231.8 | 13.62 |

ble 19 (Continued)

| | Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|---|
| | Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 6 | 38.25 | 86.62 | 2.59 | (0) | .157 | .157 | 3.375 | (0) |
| | (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| | (12.5) | 223 | 10 | 135 | .10 | .54 | 2.2 | (0) |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 17.02 | 94.25 | 2.34 | 40 | .542 | .150 | 1.350 | 3.25 |
| | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - |
| l | 13.28 | 53.94 | 2.50 | 1,060.6 | .095 | .362 | .069 | 0 |
| 7 | 81.05 | 457.81 | 17.33 | 1,235.6 | .894 | 1.209 | 6.994 | 3.25 |
| 3 | .72 | 4.1 | .15 | 11 | .008 | .011 | .06 | .03 |
| 7 | 5.95 | 201 | .112 | (270) | .060 | .29 | .187 | 2.25 |
| 5 | 6.61 | 103.5 | 4.02 | 115 | .402 | .230 | 2.30 | 454.2 |
| L | 54.91 | 796.4 | 20.99 | 6,670 | 4.830 | 1.092 | 14.95 | 2,883.6 |
| 5 | 61.52 | 899.9 | 25.01 | 6,785 | 5.232 | 1.322 | 17.25 | 3,337.8 |
| 2 | .45 | 6.6 | .18 | 48.9 | .039 | .009 | .12 | 24 |
| | 1,266 | 750 | 190.5 | (0) | 5.40 | 11.25 | 303 | 0 |
| 4 | 4.8 | 109.6 | 1.68 | 168 | .112 | .120 | .72 | 30.4 |
| | 41.3 | 59 | 3.6 | (0) | 1.73 | .54 | 8.7 | 0 |
| | 348.6 | 600 | 40.8 | (0) | 25.2 | 1.62 | 55.2 | (0) |
| | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - |
| 1 | 86.1 | 956.2 | 51.64 | 91,226.2 | 4.781 | 2.869 | 61.20 | 1,434.4 |
| 1 | 1.02 | 8 | 1.70 | 2,610 | .027 | .075 | .425 | 107.5 |
| 1 | 294.84 | 8,554 | 11.48 | 16,520 | .196 | 5.180 | .280 | (0) |
| 17 | 1.15 | 10.5 | .375 | 602.5 | .035 | .062 | .350 | 114.2 |
| 5 | 2,043.81 | 11,047.3 | 301.775 | 111126.7 | 5.039 | 21.716 | 429.875 | 1,686.5 |
| 1 | 13.62 | 73.5 | 2.013 | 740.7 | .033 | .144 | 2.865 | 11.1 |

Table 19 (Continu

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Cabbage and Carrot Salad | | | | | |
| Cabbage | 18 | $ 1.05 | $ - | 1,440 | 82.8 |
| Green Pepper | .437 | .02 | - | 41.6 | 2.01 |
| Carrots | 4 | .38 | - | 664. | 19.2 |
| Cream | .5 | .175 | - | 462 | 6.6 |
| Vinegar | .25 | .015 | - | 14 | 0 |
| Salt | .125 | - | - | - | - |
| Mazola | .5 | .225 | - | 2,006 | 0 |
| Salad Dressing | 6.5 | .10 | - | 871 | 2.5 |
| Total | 17.5 | 1.97 | - | 5,498.6 | 113.11 |
| Portion, 2.5 oz. | | .014 | - | 50.9 | 1.05 |
| Bread and Butter Sandwich | | | | | |
| Bread, enriched | 11.25 | 1.26 | - | 14,028.7 | 434.2 |
| Butter | 2 | 1.26 | - | 6,502 | 5.4 |
| Total | 11.063 | 2.52 | - | 20,530.7 | 439.6 |
| Portion, 1.125 oz. | | .015 | - | 119.7 | 2.56 |
| Apple Sauce Cake - Icing | | | | | |
| Lard | 1.875 | .73 | - | 7,678.1 | 0 |
| Sugar | 3.5 | .3325 | - | 6,118 | (0) |
| Egg, dried | .303 | - | .42 | 813.4 | 64.28 |
| Flour, cake | 3.5 | .2345 | - | 5,785.5 | 119 |
| Cornstarch | .375 | .018 | - | 616.5 | .86 |
| Baking Powder | .125 | .02 | - | - | - |
| Soda | .063 | .035 | - | - | - |
| Salt | .031 | - | - | - | - |
| Cloves | .031 | .014 | - | - | - |
| Cinnamon | .063 | .05 | - | - | - |
| Raisins | 2 | - | .38 | 2,436 | 20.8 |
| Dried Apples | 2 | - | .48 | 2,512 | 12.8 |
| Brown Sugar | 1 | .09 | - | 1,678 | (0) |
| Butter | .25 | .16 | - | 813 | .7 |
| Sugar, powdered | .25 | .025 | - | 437 | (0) |
| Total | 30.5 | 1.71 | 1.28 | 28,887.5 | 218.44 |
| Portion, 3 oz. | | .011 | .008 | 177.6 | 1.35 |
| Milk | | | | | |
| Portion, 8 oz. | | .0475 | - | 155 | 7.9 |

le 19 (Continued)

| Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|
| Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 82.8 | 2,736 | 30.6 | 4,860 | 3.6 | 3.06 | 18 | 2,970 |
| 2.01 | 18.4 | .66 | 1,054.4 | .061 | .109 | .612 | 199.9 |
| 19.2 | 624 | 12.8 | 192,000 | .88 | .88 | 9.6 | 96 |
| 6.6 | 220 | .2 | 1,875 | .07 | .32 | .2 | 3 |
| 0 | 8 | .6 | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.5 | 20 | .9 | 330 | .03 | .07 | (0) | 0 |
| 113.11 | 3,626.4 | 45.76 | 200,119.4 | 4.641 | 4.439 | 28.412 | 3,268.9 |
| 1.05 | 33.5 | .425 | 1,853 | .042 | .040 | .262 | 30.2 |
| 434.2 | 4,038.7 | 90 | 0 | 12.375 | 7.875 | 112.5 | 0 |
| 5.4 | 182 | 0 | 30,000 | .02 | .10 | 1 | 0 |
| 439.6 | 4,220.7 | 90 | 30,000 | 12.395 | 7.975 | 113.5 | 0 |
| 2.56 | 24.6 | .53 | 174.8 | .072 | .046 | .66 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 64.28 | 261 | 12.1 | 5,133.4 | .460 | 1.459 | .333 | (0) |
| 119 | 269.5 | 8.05 | (0) | .490 | .490 | 10.500 | (0) |
| .86 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 20.8 | 708 | 30 | 1,460 | 1.38 | .74 | 4.4 | Tr. |
| 12.8 | 172 | 12.8 | (0) | .86 | .86 | 8.8 | 110 |
| (0) | 345 | 11.8 | (0) | (0) | (0) | (0) | (0) |
| .7 | 23 | .0 | 3,750 | .002 | .01 | .10 | 0 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 218.44 | 1,778.5 | 74.75 | 10,343.4 | 3.192 | 3.559 | 24.133 | 110 |
| 1.35 | 10.8 | .45 | 63.6 | .018 | .021 | .147 | .66 |
| 7.9 | 268 | .2 | (360) | .08 | .39 | .3 | 3 |

Table 19 (Contin

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Orange and Grapefruit Juice | | | | | |
| Orange Juice, canned, concentrate | 1.5 | $ - | $ .67 | 1,558.7 | 28.6 |
| Grapefruit Juice, canned, unsweetened | 3 | - | .51 | 589 | 8.1 |
| Total | 17.5 | - | 1.18 | 2,147.7 | 36.7 |
| Portion, 2 oz. | | - | .008 | 15.4 | .26 |
| School 2312 | | | | | |
| Noodles | | | | | |
| Noodles | 8.063 | 1.50 | - | 13,940 | 461.2 |
| Cornstarch | 1 | .05 | - | 1,644 | 2.3 |
| Salt | | - | - | - | - |
| Total | 46.605 | 1.55 | - | 15,584 | 463.5 |
| Portion, 3 oz. | | .004 | - | 62.7 | 1.86 |
| Beef | | | | | |
| Beef, chuck, cooked | 22 | 16.50 | - | | |
| Portion, 1 oz. | | .061 | - | 87.9 | 7.37 |
| Mashed Potatoes | | | | | |
| Potatoes | 120 | - | 3.96 | 38,160 | 912 |
| Butter | 2 | 1.26 | - | 6,502 | 5.4 |
| Milk | 6 | .54 | - | 1,854 | 95.4 |
| Milk, dried | 2 | - | .28 | 4,466 | 234.2 |
| Total | 100 | 1.80 | 4.24 | 50,982 | 1,247 |
| Portion, 5 oz. | | .006 | .013 | 159.5 | 3.90 |
| Cabbage Salad | | | | | |
| Marshmallow | 1.875 | .75 | - | 2,769.4 | 25.50 |
| Pineapple, canned | 2.802 | 1.05 | - | 2,994.9 | 5.04 |
| Cabbage | 33 | 2.10 | - | 2,640 | 151.80 |
| Salad Dressing | 2 | .59 | - | 3,486 | 10 |
| Sugar | .5 | .045 | - | 874 | (0) |
| Milk, evaporated | 1.75 | .20 | - | 1,093.7 | 55.65 |
| Vinegar | .5 | .03 | - | 28 | 0 |
| Salt | | - | - | - | - |
| Total | 29.75 | 4.77 | - | 11,866 | 247.99 |
| Portion, 2 oz. | | .020 | - | 49.8 | 1.04 |

ble 19 (Continued)

| | Protein | Calcium | Iron | Vitamin A Value | Thiamine | Riboflavin | Niacin | Ascorbic Acid |
|---|---|---|---|---|---|---|---|---|
| | Gm. | Mg. | Mg. | I.U. | Mg. | Mg. | Mg. | Mg. |
| 7 | 28.6 | 415.5 | 10.95 | 3,480 | 2.52 | .570 | 7.80 | 1,504.5 |
| | 8.1 | 123 | 4.2 | 600 | .63 | .24 | 2.70 | 513 |
| 7 | 36.7 | 538.5 | 15.15 | 4,080 | 3.15 | .810 | 10.50 | 2,017.5 |
| 4 | .26 | 3.8 | .10 | 29.2 | .022 | .006 | .074 | 14.4 |
| | 461.2 | 806.2 | 76.59 | 7,175.6 | 7.337 | 4.031 | 83.85 | (0) |
| | 2.3 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| | - | - | - | - | - | - | - | - |
| | 463.5 | 806.2 | 76.59 | 7,175.6 | 7.337 | 4.031 | 83.85 | 0 |
| | 1.86 | 3.3 | .30 | 28.8 | .030 | .015 | .33 | 0 |
| | 7.37 | 3.1 | .88 | (0) | .014 | .058 | 1.17 | 0 |
| | 912 | 5,040 | 324 | 8,400 | 48 | 18 | 528 | 7,680 |
| | 5.4 | 182 | .0 | 30,000 | .02 | .10 | 1. | 0 |
| | 95.4 | 3,216 | 1.8 | (4,320) | .96 | 4.68 | 3 | 30 |
| | 234.2 | 8,616 | 5.2 | 12,720 | 2.76 | 13.26 | 6 | 58 |
| | 1,247 | 17,054 | 331 | 55,440 | 51.74 | 36.04 | 538 | 7,768 |
| | 3.90 | 53.5 | 1.05 | 173 | .160 | .110 | 1.70 | 24 |
| | 25.50 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| | 5.04 | 369.9 | 7.57 | 1,008.9 | .981 | .196 | 2.242 | 114.9 |
| | 151.80 | 5,016 | 56.10 | 8,910 | 6.600 | 5.610 | 33 | 5,445 |
| | 10 | 82 | 3.6 | 1,320 | .140 | .28 | (0) | 0 |
| | (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| | 55.65 | 1,930.2 | 1.40 | 3,185 | .385 | 2.852 | 1.575 | 8.75 |
| | 0 | 16 | 1.10 | - | - | - | - | - |
| | - | - | - | - | - | - | - | - |
| | 247.99 | 7,414.1 | 69.77 | 14,423.9 | 8.106 | 8.938 | 36.817 | 5,568.65 |
| | 1.04 | 31.2 | .30 | 60.6 | .034 | .038 | .16 | 23.4 |

Table 19 (Continue

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Fruit Gelatin | | | | | |
| Gelatin Dessert Powder | 2.187 | $ .96 | $ - | 3,773.4 | 93.41 |
| Bananas | 27.5 | 3 | - | 7,397.5 | 99 |
| Total | 38.75 | 3.96 | - | 11,170.9 | 192.41 |
| Portion, 2.5 oz. | | .016 | - | 45 | .77 |
| Sandwich | | | | | |
| Bread, white, enriched | 31 | 4.25 | - | 38,657 | 1,196.6 |
| Butter | 3 | 1.89 | - | 9,753 | 8.1 |
| Margarine | 3 | 1.11 | - | 9,807 | 8.1 |
| Total | 32.5 | 7.25 | - | 58,217 | 1,212.8 |
| Portion, 1.25 oz. | | .018 | - | 139.9 | 2.9 |
| Milk | | | | | |
| Portion, 8 oz. | | .05 | - | 155 | 7.9 |
| School 2313 | | | | | |
| Cheese | | | | | |
| Cheese, cheddar | 10 | - | 5.10 | | |
| Portion, 1 oz. | | - | .032 | 104.9 | 6.6 |
| Baked Potatoes | | | | | |
| Potatoes, A.P. | 40 | - | 1.28 | | |
| Portion, 3 oz. | | - | .007 | 59.7 | 1.43 |
| Margarine | | | | | |
| Margarine | 5 | 1.80 | - | | |
| Portion, .5 oz. | | .01 | - | 102.1 | .08 |
| Green Beans, canned | | | | | |
| Green Beans | 35.125 | 4.86 | - | 2,915.4 | 158.1 |
| Margarine | 1.5 | .54 | - | 4,903.5 | 4.05 |
| Total | 36 | 5.40 | - | 7,818.9 | 162.15 |
| Portion, 3 oz. | | .028 | - | 40.8 | .84 |

Table 19 (Continued)

| d gy . | Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|---|
| 3.4 | 93.41 | (0) | (0) | (0) | (0) | (0) | (0) | (0) |
| 7.5 | 99 | 660 | 49.50 | 35,750 | 3.575 | 3.850 | 60.50 | 797.5 |
| 0.9 | 192.41 | 660 | 49.50 | 35,750 | 3.575 | 3.850 | 60.50 | 797.5 |
| 5 | .77 | 2.7 | .20 | 144.2 | .015 | .015 | .25 | 3.2 |
| 7 | 1,196.6 | 11,129 | 248 | 0 | 34.100 | 21.70 | 310 | 0 |
| 3 | 8.1 | 273 | 0 | 45,000 | .03 | .15 | 1.5 | 0 |
| 7 | 8.1 | 273 | 0 | 45,000 | (0) | (0) | (0) | (0) |
| 7 | 1,212.8 | 11,675 | 248 | 90,000 | 34.13 | 21.85 | 311.5 | 0 |
| 9.9 | 2.9 | 28 | .60 | 216.4 | .0825 | .052 | .75 | 0 |
| 5 | 7.9 | 268 | .2 | (360) | .08 | .39 | .30 | .30 |
| 4.9 | 6.6 | 190.9 | .26 | 368.7 | .004 | .116 | (.006) | 0 |
| 9.7 | 1.43 | 7.9 | .507 | 13.1 | .075 | .028 | .825 | 12 |
| 2.1 | .08 | 2.8 | .0 | 468.7 | (0) | (0) | (0) | (0) |
| 5.4 | 158.1 | 4,320.4 | 224.8 | 66,035 | 5.269 | 6.674 | 45.66 | 632.25 |
| 3.5 | 4.05 | 136.5 | 0 | 22,500 | (0) | (0) | (0) | (0) |
| 8.9 | 162.15 | 4,456.9 | 224.8 | 88,535 | 5.269 | 6.674 | 45.66 | 632.25 |
| 0.8 | .84 | 23.1 | 1.17 | 461.1 | .027 | .036 | .24 | 3.3 |

Table 19 (Cont

| Food Items | Weight in Pounds | Cost of Food Purchased | Value of U.S.D.A. Com. | Food Energy Cal. | Protein Gm. |
|---|---|---|---|---|---|
| Bread and Margarine | | | | | |
| Bread, enriched | 14.25 | $ 3.06 | $ - | 17,769.7 | 550.05 |
| Margarine | 4 | 1.44 | - | 13,076 | 10.8 |
| Total | 18.25 | 4.50 | - | 30,845.7 | 560.85 |
| Portion, 1 oz. | | .015 | - | 105.6 | 1.92 |
| Peaches, canned | | | | | |
| Peaches | 36.375 | 6.54 | - | 11,203.5 | |
| Sugar | 2 | .18 | - | 3,496 | (0) |
| Total | 38 | 6.72 | - | 14,699.5 | |
| Portion, 3 oz. | | .033 | - | 72.6 | .34 |
| Peanut Butter Cooky | | | | | |
| Lard | .5 | - | - | 2,047 | 0 |
| Peanut Butter | 2.75 | - | .8525 | 7,191.2 | 325.87 |
| Sugar, white | 1.25 | .1125 | - | 2,185 | (0) |
| Sugar, brown | 1 | .09 | - | 1,678 | 0 |
| Salt | .046 | .001 | - | - | - |
| Flour | 2 | .134 | - | 3,308 | 95.4 |
| Eggs, dried | .375 | - | .50 | 1,008.4 | 79.69 |
| Soda | .046 | .002 | - | - | - |
| Milk | 1.5 | .135 | - | 463.5 | 23.85 |
| Total | 9.8025 | .48 | 1.35 | 17,881.1 | 524.81 |
| Portion, .75 oz. | | .002 | .007 | 85.4 | 2.50 |
| Orange Juice | | | | | |
| Orange Juice, canned, concentrate | 2 | - | .90 | 2,078 | 38.2 |
| Sugar | 1 | .09 | - | 1,748 | (0) |
| Total (224 oz.) | 14 | .09 | .90 | 3,826 | 38.2 |
| Portion, 3 oz. | | .001 | .012 | 51.3 | .51 |
| Milk | | | | | |
| Portion, 8 oz. | | .035 | - | 155 | 7.9 |

e 19 (Continued)

| Protein Gm. | Calcium Mg. | Iron Mg. | Vitamin A Value I.U. | Thiamine Mg. | Riboflavin Mg. | Niacin Mg. | Ascorbic Acid Mg. |
|---|---|---|---|---|---|---|---|
| 550.05 | 5,115.7 | 114 | 0 | 15.675 | 9.975 | 142.5 | 0 |
| 10.8 | 364 | 0 | 60,000 | (0) | (0) | (0) | (0) |
| 560.85 | 5,479.7 | 114 | 60,000 | 15.675 | 9.975 | 142.5 | 0 |
| 1.92 | 18.8 | .39 | 205.5 | .054 | .034 | .49 | 0 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| .34 | 4.31 | .34 | 386.5 | .006 | .017 | .581 | 3.6 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 325.87 | 924 | 23.65 | 0 | 1.485 | 1.650 | 202.1 | (0) |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 0 | 345 | 11.8 | (0) | (0) | (0) | (0) | (0) |
| - | - | - | - | - | - | - | - |
| 95.4 | 146 | 26 | (0) | 4 | 2.400 | 32 | (0) |
| 79.69 | 323.6 | 15 | 6,363.7 | .570 | 1.796 | .412 | (0) |
| - | - | - | - | - | - | - | - |
| 23.85 | 804 | .45 | 1,080 | .240 | 1.170 | .750 | 9 |
| 524.81 | 2,542.6 | 76.90 | 7,443.7 | 6.295 | 7.016 | 235.262 | 9 |
| 2.50 | 12.1 | .37 | 35.5 | .03 | .034 | 1.12 | .04 |
| 38.2 | 554 | 14.6 | 4,640 | 3.36 | .76 | 10.4 | 2,006 |
| (0) | - | - | (0) | (0) | (0) | (0) | (0) |
| 38.2 | 554 | 14.6 | 4,640 | 3.36 | .76 | 10.4 | 2,006 |
| .51 | 7.5 | .18 | 62.1 | .045 | .009 | .138 | 25.7 |
| 7.9 | 268 | .2 | (360) | .08 | .39 | .3 | 3 |

Table 20. Percentage of Recommended Daily Dietary Allowances Provide
on the Day Observed, the Number of Portions Prepared and

| School | Menu Items | Portions Prepared No. | Standard Portion Oz. | Food Energy % | Protein % | Calcium % | Iron % | V: A |
|---|---|---|---|---|---|---|---|---|
| 230 | Creamed Potatoes | 374 | 4 | 6.36 | 5.28 | 4.83 | 6.67 | |
| (May 4) | Ground Minced Ham Sandwich | 260 | 2 | 7.84 | 9.43 | 3.33 | 10.00 | |
| | Cabbage Salad | 197 | 1.5 | 2.28 | 1.00 | 1.83 | 2.50 | |
| | Spiced Nut Cooky | 216 | 1 | 4.96 | 2.86 | 1.33 | 4.16 | |
| | Milk | 193 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | |
| | Orange Juice | 224 | 4 | 2.28 | .86 | 1.29 | 1.67 | |
| | Total | - | 20.5 | 29.92 | 30.71 | 34.42 | 26.67 | |
| 230 | Hamburger Gravy | 344 | 2 | 4.32 | 8.71 | 5.92 | 5.83 | |
| (May 5) | Baking Powder Biscuit | 340 | 2 | 5.16 | 3.71 | 1.83 | 5.00 | |
| | Green Beans | 244 | 2 | 1.00 | 1.00 | 1.50 | 7.50 | |
| | Bread and Butter Sandwich | 232 | 1 | 4.24 | 3.43 | 1.92 | 4.16 | |
| | Apple | 250 | 3 | 1.76 | .29 | .33 | 1.67 | |
| | Milk | 220 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | |
| | Orange Juice | 224 | 4 | 2.28 | .86 | .75 | 1.67 | |
| | Total | - | 22 | 24.96 | 29.28 | 34.58 | 27.50 | |
| 230 | Scalloped Potatoes and Ham | 246 | 6 | 14.08 | 17.14 | 10.25 | 16.67 | |
| (May 6) | Fruit Salad | 200 | 3 | 2.88 | .57 | .83 | 3.33 | |
| | Bread and Butter Sandwich | 288 | 1 | 4.76 | 3.86 | 2.17 | 5.00 | |
| | Milk | 225 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | |
| | Orange Juice | 200 | 4 | 2.40 | 1.00 | .83 | 2.50 | |
| | Total | - | 22 | 30.32 | 33.85 | 36.41 | 29.17 | |
| 110 | Baked Hash | 420 | 4 | 6.68 | 14.28 | 1.50 | 15.00 | |
| | Baked Tomatoes and Bread | 128 | 3.5 | 2.48 | 2.43 | 1.58 | 7.50 | |
| | Apple, Grape and Celery Salad | 248 | 2 | 2.24 | .43 | .67 | 1.67 | |
| | Milk | 184 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | |
| | Total | - | 17.5 | 17.60 | 28.42 | 26.08 | 25.84 | |

nces Provided by a Standard Portion of Each Food Served in 26 Iowa Schools
repared and the Per Portion Size, Preparation Time and Cost

| m | Iron % | Vitamin A Value % | Thiamine % | Riboflavin % | Niacin % | Ascorbic Acid % | Time for Preparation Min. | Cost of Food Purchased | Value of U.S.D.A. Com. |
|---|---|---|---|---|---|---|---|---|---|
| | 6.67 | 2.89 | 10.00 | 6.67 | 10.83 | 24.00 | 1.07 | $ .012 | $ .009 |
| | 10.00 | 2.36 | 13.33 | 6.67 | 11.67 | 0 | .54 | .036 | - |
| | 2.50 | 1.07 | 2.50 | 1.67 | .83 | 30.67 | .43 | .018 | .002 |
| | 4.16 | .84 | 5.00 | 2.77 | 2.50 | 0 | .52 | .006 | .01 |
| | 1.67 | 8.00 | 6.61 | 21.67 | 2.50 | 4.00 | .00 | .050 | - |
| | 1.67 | 1.75 | 5.00 | .55 | .83 | 45.33 | .07 | .001 | .013 |
| | 26.67 | 16.91 | 42.50 | 40.00 | 29.16 | 104.00 | 2.63 | .123 | .034 |
| | 5.83 | 2.04 | 5.00 | 7.78 | 9.17 | 1.33 | .34 | .034 | - |
| | 5.00 | .56 | 8.33 | 4.44 | 5.83 | Tr. | .50 | .010 | - |
| | 7.50 | 7.40 | 1.67 | 1.11 | 1.67 | 4.00 | .09 | .025 | - |
| | 4.16 | 2.87 | 5.83 | 2.22 | 5.00 | 0 | .15 | .015 | - |
| | 1.67 | 1.49 | 2.50 | 1.11 | .83 | 4.00 | .08 | .000 | .018 |
| | 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | .00 | .050 | - |
| | 1.67 | 1.75 | 5.00 | .55 | 1.67 | 45.33 | .07 | .001 | .013 |
| | 27.50 | 24.11 | 35.00 | 38.88 | 26.67 | 58.66 | 1.23 | .135 | .031 |
| | 16.67 | 3.75 | 35.00 | 16.67 | 26.67 | 30.67 | 1.16 | .082 | - |
| | 3.33 | 2.89 | 2.50 | 1.11 | 2.50 | 5.33 | 1.10 | .034 | .009 |
| | 5.00 | 3.29 | 6.67 | 2.78 | 5.83 | 0 | .17 | .017 | - |
| | 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | .00 | .050 | - |
| | 2.50 | 1.87 | 5.00 | .55 | 1.67 | 48.00 | .07 | .001 | .001 |
| | 29.17 | 19.80 | 55.84 | 42.78 | 39.17 | 88.00 | 2.50 | .184 | .010 |
| | 15.00 | .38 | 10.00 | 6.67 | 25.00 | 18.67 | .68 | .065 | - |
| | 7.50 | 35.71 | 5.83 | 3.88 | 9.17 | 32.00 | .38 | .045 | - |
| | 1.67 | 1.13 | 1.67 | 1.11 | .83 | 4.00 | .63 | .014 | - |
| | 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .0475 | - |
| | 25.84 | 45.22 | 24.17 | 33.33 | 37.50 | 58.67 | 1.69 | .172 | - |

Table 20 (Conti

| School | Menu Items | Portions Prepared No. | Standard Portion Oz. | Food Energy % | Protein % | Calcium % | Iron % | Vit A |
|---|---|---|---|---|---|---|---|---|
| 111 | Beef Burger | 231 | 2 | 14.44 | 23.14 | 3.42 | 22.50 | |
| | Bun with Butter | 200 | 2.25 | | | | | |
| | Mashed Potatoes | 208 | 3 | 2.96 | 3.43 | 3.00 | 5.00 | |
| | Gravy | 200 | 3 | | | | | |
| | Cranberry Salad | 226 | 2 | 3.44 | 2.14 | .58 | .83 | |
| | Whole Wheat Bread and Margarine Sandwich | 128 | 2 | 8.04 | 6.86 | 4.08 | 9.17 | |
| | White Cake | 249 | 2 | 5.84 | 2.14 | 1.33 | 1.66 | |
| | Cherry Sauce | 218 | 2 | | | | | |
| | Milk | 312 | 8 | 6.20 | 11.29 | 22.33 | 1.67 | |
| | Orange and Grapefruit Juice | 144 | 2 | 1.92 | .71 | .67 | 2.50 | |
| | Total | - | 28.25 | 42.84 | 49.71 | 35.41 | 43.33 | |
| 112 | Toasted Cheese on Bun | 140 | 4 | 15.44 | 26.14 | 34.42 | 12.50 | |
| | Creamed Peas | 121 | 4 | 4.56 | 5.86 | 3.58 | 15.00 | |
| | Apple Salad | 140 | 3 | 3.12 | .57 | .50 | 2.50 | |
| | White Cake | 140 | 2 | 9.76 | 3.71 | 2.08 | 5.83 | |
| | Brown Sugar Sauce | 132 | 1 | | | | | |
| | Milk | 140 | 8 | 6.20 | 11.29 | 22.33 | 1.67 | |
| | Orange Juice | 112 | 6 | 3.16 | 1.43 | 1.25 | 3.33 | |
| | Total | - | 28 | 42.24 | 49.00 | 64.16 | 40.83 | |
| 113 | Roast Beef | 416 | 1 | 5.44 | 10.72 | 1.75 | 10.83 | |
| | Gravy | 312 | 2 | | | | | |
| | Bread | 148 | .8 | | | | | |
| | Mashed Potatoes | 400 | 3 | 2.92 | 2.57 | 2.00 | 4.16 | |
| | Fruit Gelatin | 100 | 2 | 4.72 | 3.43 | .42 | 1.67 | |
| | Milk | 120 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | |
| | Total | - | 16.8 | 19.28 | 28.00 | 26.50 | 18.33 | |
| 121 | Beef and Gravy | 127 | 2 | 3.72 | 2.57 | .33 | 9.17 | |
| | Mashed Potatoes | 124 | 3 | 3.96 | 4.29 | 4.33 | 5.83 | |
| | Carrots, Raw | 192 | 1 | .48 | .43 | .92 | 1.67 | |
| | Celery, Raw | 96 | .5 | .12 | .29 | .58 | .83 | |
| | Fruit Gelatin | 160 | 3 | 3.88 | 2.71 | .25 | .83 | |
| | Bread and Margarine Sandwich | 70 | 1.25 | 5.00 | 3.43 | 2.08 | 4.16 | |
| | Milk | 120 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | |
| | Total | - | 18.75 | 23.36 | 25.00 | 30.82 | 24.16 | |

able 20 (Continued)

| um | Iron % | Vitamin A Value % | Thiamine % | Riboflavin % | Niacin % | Ascorbic Acid % | Time for Preparation Min. | Cost of Food Purchased | Value of U.S.D.A. Com. |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 22.50 | 5.29 | 15.83 | 10.55 | 32.50 | 0 | .31 | $ .061 | $ - |
| | | | | | | | .02 | .043 | - |
| 0 | 5.00 | .31 | 8.30 | 3.33 | 7.50 | 16.00 | 1.16 | .000 | .008 |
| | | | | | | | .08 | .001 | - |
| 8 | .83 | .13 | 1.67 | .56 | .83 | 1.33 | .04 | .017 | .007 |
| 3 | 9.17 | 6.49 | 11.66 | 4.44 | 11.67 | 0 | 1.28 | .025 | - |
| 3 | 1.66 | 2.91 | .88 | 1.67 | .83 | 1.33 | .24 | .006 | .003 |
| | | | | | | | .03 | .007 | - |
| 3 | 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .0475 | - |
| 7 | 2.50 | .82 | 3.33 | 1.11 | 1.67 | 45.34 | .01 | .001 | .013 |
| 1 | 43.33 | 23.95 | 48.34 | 43.33 | 57.50 | 68.00 | 3.17 | .209 | .031 |
| 2 | 12.50 | 16.38 | 12.50 | 17.77 | 10.83 | 0 | 1.53 | .022 | .056 |
| 3 | 15.00 | 14.76 | 10.83 | 5.55 | 9.16 | 10.67 | .30 | .039 | - |
| 3 | 2.50 | 2.27 | 2.50 | 1.11 | 1.67 | 5.33 | .56 | .026 | - |
| 3 | 5.83 | 2.11 | 6.67 | 4.44 | 4.17 | 0 | .36 | .020 | - |
| | | | | | | | .31 | .004 | - |
| 3 | 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .050 | - |
| 5 | 3.33 | 2.76 | 7.50 | 1.11 | 2.50 | 72.00 | .19 | .001 | .024 |
| 5 | 40.83 | 46.27 | 46.67 | 51.67 | 30.83 | 92.00 | 3.25 | .162 | .080 |
| | | | | | | | ( .05 | .037 | - |
| 5 | 10.83 | 0 | 7.50 | 5.00 | 15.83 | 0 | ( .01 | .001 | - |
| | | | | | | | ( .00 | .008 | - |
| 3 | 4.16 | 1.57 | .83 | 2.77 | 6.66 | 14.67 | .19 | .012 | - |
| 2 | 1.67 | 1.80 | .83 | .56 | 1.67 | 2.66 | .20 | .024 | - |
| 3 | 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | .00 | .0475 | - |
| 3 | 18.33 | 11.37 | 15.83 | 30.00 | 26.66 | 21.33 | .45 | .130 | - |
| 1 | 9.17 | 0 | 3.33 | 3.89 | 14.17 | 0 | .31 | .042 | - |
| 1 | 5.83 | 1.44 | 10.00 | 5.00 | 9.16 | 21.33 | .87 | .004 | .009 |
| 2 | 1.67 | 76.00 | 1.67 | 1.11 | 1.67 | 2.67 | .13 | .007 | - |
| 1 | .83 | 0 | .83 | .55 | .83 | 1.33 | .31 | .006 | - |
| 1 | .83 | 2.60 | 0 | .56 | 1.67 | 1.33 | .20 | .027 | - |
| 1 | 4.16 | 5.84 | 5.83 | 2.22 | 5.83 | 0 | .36 | .021 | - |
| 1 | 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .0475 | - |
| 2 | 24.16 | 93.88 | 28.33 | 35.00 | 35.83 | 30.66 | 2.18 | .155 | .009 |

Table 20 (Contin

| School | Menu Items | Portions Prepared No. | Standard Portion Oz. | Food Energy % | Protein % | Calcium % | Iron % | Vit A V |
|---|---|---|---|---|---|---|---|---|
| 122 | Potato Soup | 250 | 6 | 4.00 | 6.00 | 11.17 | 1.67 | 4 |
| | Crackers | 320 | .5 | 2.44 | 1.86 | .25 | .83 | 0 |
| | Carrots, Raw | 320 | .5 | .24 | .29 | .50 | .83 | 38 |
| | Cheese Sandwich | 330 | 1.25 | 3.96 | 5.57 | 5.25 | 5.00 | 1 |
| | Ginger Bread | 330 | 1.5 | 5.12 | 2.43 | 2.08 | 6.67 | |
| | Orange Juice | 224 | 4 | 1.80 | 1.00 | .83 | 1.67 | 1 |
| | Milk | 251 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | 8 |
| | Total | - | 21.75 | 23.76 | 28.43 | 42.41 | 18.34 | 54 |
| 123 | Baked Hash | 225 | 5 | 9.08 | 21.43 | 1.42 | 21.67 | |
| | Stewed Tomatoes | 96 | 3 | 1.96 | 1.14 | .83 | 4.16 | 22 |
| | Apple Crisp<br>Whipped Cream | 300 | 2.5 | 6.76 | 1.14 | .50 | 2.50 | 2 |
| | Whole Wheat Bread and Margarine Sandwich | 272 | 1 | 3.80 | 3.58 | 2.08 | 4.16 | 2 |
| | Milk | 268 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | 8 |
| | Total | - | 19.50 | 27.80 | 38.57 | 27.16 | 34.16 | 35 |
| 211 | Barbecued Hamburger | 108 | 2 | 8.72 | 16.00 | 2.33 | 15.84 | 1 |
| | Bun | 108 | 1.25 | | | | | |
| | Potato Chips | 100 | 1 | 6.16 | 2.71 | .67 | 4.17 | |
| | Creamed Peas | 100 | 2 | 2.40 | 4.00 | 2.58 | 10.00 | 7 |
| | Celery Sticks | 100 | .5 | .12 | .29 | .58 | .83 | 0 |
| | Tutti Fruiti Ball | 90 | .75 | 2.60 | .71 | .83 | 3.33 | 1 |
| | Bread Pudding, Vanilla Sauce | 100 | 2 | 7.36 | 4.71 | 5.42 | 3.33 | 2 |
| | Milk | 182 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | 8 |
| | Orange Juice | 75 | 4 | 1.68 | .57 | .42 | .83 | |
| | Total | - | 20.5 | 35.24 | 40.27 | 35.16 | 40.00 | 22 |
| 212 | Scalloped Ham and Noodles | 400 | 5 | 12.84 | 19.14 | 2.33 | 15.84 | 1 |
| | Peas, canned | 150 | 3 | 2.32 | 4.14 | 1.75 | 12.50 | 10 |
| | Carrots, Raw | 75 | .5 | .24 | .29 | .50 | .83 | 38 |
| | Celery Sticks | 75 | .5 | .12 | .29 | .58 | .83 | 0 |
| | Roll and Butter | 120 | 1.3 | 6.24 | 3.86 | 1.50 | 4.17 | 6 |
| | Chocolate Cake | 75 | 2 | 21.36 | 8.43 | 5.09 | 10.00 | 3 |
| | Milk | 312 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | 8 |
| | Total | - | 20.3 | 49.32 | 47.43 | 34.08 | 45.84 | 68 |

20 (Continued)

| Iron % | Vitamin A Value % | Thiamine % | Riboflavin % | Niacin % | Ascorbic Acid % | Time for Preparation Min. | Cost of Food Purchased | Value of U.S.D.A. Com. |
|---|---|---|---|---|---|---|---|---|
| 1.67 | 4.64 | 5.00 | 10.00 | 3.33 | 6.67 | .54 | .019 | .002 |
| .83 | 0 | .83 | .55 | .83 | 0 | 0 | .006 | - |
| .83 | 38.00 | .83 | .56 | 0 | 1.33 | .14 | .004 | - |
| 5.00 | 1.69 | 5.83 | 3.33 | 5.84 | 0 | .21 | .010 | .008 |
| 6.67 | .91 | 4.17 | 2.22 | 3.33 | 0 | .13 | .016 | - |
| 1.67 | 1.73 | 5.00 | .55 | 1.67 | 49.33 | .06 | .0004 | .015 |
| 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .0475 | - |
| 18.34 | 54.97 | 28.33 | 38.88 | 17.50 | 61.33 | 1.08 | .103 | .025 |
| 21.67 | .33 | 11.66 | 8.33 | 35.00 | 17.33 | .92 | .091 | .006 |
| 4.16 | 22.25 | 2.50 | 1.67 | 5.00 | 17.33 | .22 | .006 | .030 |
| 2.50 | 2.18 | 4.17 | .55 | 1.67 | 4.00 | .55 | .026 | - |
| 4.16 | 2.44 | 5.83 | 2.22 | 5.83 | 0 | .38 | .011 | - |
| 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .0475 | - |
| 34.16 | 35.20 | 30.83 | 34.44 | 50.00 | 42.66 | 2.07 | .182 | .036 |
| 15.84 | 1.93 | 10.83 | 7.22 | 23.34 | 1.33 | ( .35<br>( | .048<br>.015 | -<br>- |
| 4.17 | .31 | 4.17 | 1.67 | 7.50 | 4.00 | .13 | .029 | - |
| 10.00 | 7.92 | 6.67 | 3.89 | 5.83 | 6.67 | 1.06 | .021 | - |
| .83 | 0 | .83 | .55 | .83 | 1.33 | .52 | .008 | - |
| 3.33 | 1.13 | 1.66 | 1.11 | 1.67 | 1.33 | .47 | .005 | .01 |
| 3.33 | 2.51 | 4.17 | 6.67 | 2.50 | 0 | .58 | .012 | .007 |
| 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .0425 | - |
| .83 | .93 | 2.50 | .35 | .83 | 24.00 | .37 | .001 | .014 |
| 40.00 | 22.73 | 37.50 | 43.33 | 45.00 | 42.66 | 3.48 | .182 | .03 |
| 15.84 | 1.44 | 40.00 | 7.78 | 24.17 | 0 | .43 | .095 | - |
| 12.50 | 10.29 | 8.33 | 2.78 | 7.50 | 9.34 | .04 | .034 | - |
| .83 | 38.09 | .83 | .55 | .83 | 1.33 | .39 | .003 | - |
| .83 | 0 | .83 | .55 | .83 | 1.33 | .52 | .009 | - |
| 4.17 | 6.96 | 5.84 | 2.22 | 5.83 | 0 | .08 | .026 | - |
| 10.00 | 3.29 | 3.33 | 7.22 | 3.34 | 0 | 1.27 | .056 | - |
| 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .045 | - |
| 45.84 | 68.07 | 65.83 | 42.77 | 45.00 | 16.00 | 2.73 | .268 | - |

Table 20 (Contin

| School | Menu Items | Portions Prepared No. | Standard Portion Oz. | Food Energy % | Protein % | Calcium % | Iron % | Vit A V % |
|---|---|---|---|---|---|---|---|---|
| 213 | Baked Beans | 175 | 4 | 8.92 | 14.86 | 6.42 | 28.33 | 7 |
| | Cole Slaw | 175 | 1.5 | .60 | .71 | 1.25 | 1.67 | |
| | Peanut Butter and Margarine Sandwich | 220 | 1.5 | 6.40 | 5.71 | 2.42 | 5.00 | 4 |
| | Fruit Gelatin | 165 | 2 | 2.68 | 2.29 | .58 | .83 | |
| | Milk | 136 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | 8 |
| | Total | - | 17.0 | 24.80 | 34.85 | 33.00 | 37.50 | 20 |
| 221 | Beef and Noodles | 140 | 2.5 | 7.88 | 19.58 | 1.83 | 16.67 | 6 |
| | Buttered Peas | 110 | 1.5 | 1.84 | 2.00 | .92 | 5.83 | 6 |
| | Homemade Bread and Honey Butter | 120 | 1.5 | 6.80 | 5.00 | 1.92 | 8.33 | 3 |
| | Apple Crisp | 120 | 2 | 3.56 | .71 | .92 | 3.33 | 3 |
| | Milk | 117 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | 8 |
| | Orange and Grapefruit Juice | 112 | 4 | 2.56 | 1.00 | .83 | 2.50 | 1 |
| | Total | - | 19.5 | 28.84 | 39.57 | 28.75 | 38.33 | 29 |
| 222 | Beans with Ham | 100 | 6 | 12.08 | 9.43 | 1.00 | 9.16 | 3 |
| | Cornbread, Honey, Margarine | 185 | 3 | 7.64 | 5.57 | 1.83 | 5.00 | 5 |
| | Celery Sticks | 100 | .75 | .16 | .43 | .92 | .83 | 0 |
| | Fruit Gelatin | 100 | 3 | 4.40 | 3.00 | .58 | 2.50 | 7 |
| | Milk | 211 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | 8 |
| | Orange Juice | 90 | 3 | 2.00 | .86 | .67 | 1.67 | 1 |
| | Total | - | 23.75 | 32.48 | 30.57 | 27.33 | 20.83 | 25 |
| 223 | Spaghetti and Tomatoes | 150 | 2 | 2.68 | 3.00 | .67 | 4.17 | 11 |
| | Cheese | 150 | 1 | 4.20 | 9.43 | 15.91 | 2.50 | 8 |
| | Buttered Green Beans | 150 | 4 | 1.28 | 1.71 | 2.67 | 13.33 | 11 |
| | Cabbage Wedge | 150 | .67 | .16 | .43 | .75 | .83 | |
| | Peanut Butter Sandwich | 200 | 2 | 7.28 | 7.43 | 3.08 | 6.67 | 3 |
| | Fruit Gelatin | 150 | 2 | 2.12 | 1.43 | .17 | .83 | 1 |
| | Milk | 145 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | 8 |
| | Grapefruit Juice | 170 | 3 | 1.28 | .57 | .58 | 2.50 | |
| | Total | - | 22.67 | 25.16 | 35.28 | 46.16 | 32.50 | 41 |

e 20 (Continued)

| Iron % | Vitamin A Value % | Thiamine % | Riboflavin % | Niacin % | Ascorbic Acid % | Time for Preparation Min. | Cost of Food Purchased | Value of U.S.D.A. Com. |
|---|---|---|---|---|---|---|---|---|
| 28.33 | 7.33 | 27.50 | 6.67 | 11.67 | 4.00 | .69 | $ .021 | $ .008 |
| 1.67 | .64 | 1.66 | 1.11 | .83 | 21.33 | .39 | .007 | - |
| 5.00 | 4.27 | 6.67 | 2.78 | 13.33 | 0 | .09 | .012 | .005 |
| .83 | .27 | 1.66 | .55 | .83 | 10.67 | .27 | .017 | .005 |
| 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .050 | - |
| 37.50 | 20.51 | 44.16 | 32.78 | 29.16 | 40.00 | 1.44 | .107 | .018 |
| 16.67 | 6.44 | 10.00 | 10.55 | 20.83 | 0 | .46 | .057 | .019 |
| 5.83 | 6.47 | 4.17 | 1.11 | 3.33 | 4.00 | .07 | .034 | - |
| 8.33 | 3.24 | 9.16 | 8.33 | 10.83 | 0 | .63 | .015 | .004 |
| 3.33 | 3.00 | 1.67 | .56 | 1.67 | 1.33 | .33 | .009 | .008 |
| 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .045 | - |
| 2.50 | 1.87 | 5.00 | 1.11 | 1.67 | 52.00 | .13 | .001 | .017 |
| 38.33 | 29.02 | 36.67 | 43.33 | 40.83 | 61.33 | 1.62 | .161 | .048 |
| 9.16 | 3.09 | 21.66 | 3.89 | 11.67 | 0 | .69 | .073 | - |
| 5.00 | 5.38 | 5.83 | 3.34 | 3.33 | 0 | .22 | .015 | .001 |
| .83 | 0 | .83 | .55 | .83 | 1.33 | .28 | .008 | - |
| 2.50 | 7.02 | 1.67 | .55 | 2.50 | 5.33 | .31 | .051 | - |
| 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .045 | - |
| 1.67 | 1.55 | 4.17 | .55 | 1.67 | 40.00 | .67 | .001 | .012 |
| 20.83 | 25.04 | 40.83 | 30.55 | 22.50 | 50.66 | 2.17 | .193 | .013 |
| 4.17 | 11.24 | 3.33 | 1.11 | 5.00 | 9.34 | .43 | .009 | .012 |
| 2.50 | 8.20 | 0 | 6.67 | 0 | 0 | 0 | - | .028 |
| 13.33 | 11.82 | 3.33 | 2.78 | 2.50 | 5.33 | .07 | .044 | - |
| .83 | .33 | .83 | .55 | .83 | 12.00 | .13 | .001 | - |
| 6.67 | 3.33 | 8.34 | 3.89 | 16.67 | 0 | .41 | .020 | .004 |
| .83 | 1.02 | .83 | .55 | .83 | 1.33 | .15 | .012 | - |
| 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .050 | - |
| 2.50 | .16 | 2.50 | .55 | .83 | 40.00 | .10 | - | .018 |
| 32.50 | 44.10 | 25.83 | 37.77 | 29.16 | 72.00 | 1.29 | .136 | .052 |

Table 20 (Conti

| School | Menu Items | Portions Prepared No. | Standard Portion Oz. | Food Energy % | Protein % | Calcium % | Iron % | Vit A |
|---|---|---|---|---|---|---|---|---|
| 231 | Creamed Turkey | 132 | 2 | 9.04 | 20.86 | 6.67 | 20.84 | |
| | Mashed Potatoes | 260 | 3 | 2.72 | 3.57 | 2.92 | 5.83 | |
| | Cabbage and Carrot Salad | 116 | 2 | 1.68 | 1.86 | 1.83 | 3.33 | 4 |
| | Peanut Butter Sandwich | 120 | 1.5 | 7.16 | 8.29 | 2.92 | 5.83 | |
| | Apple | 120 | 2 | 1.16 | .14 | .25 | .83 | |
| | Milk | 110 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | |
| | Total | - | 18.5 | 27.96 | 46.00 | 36.92 | 38.33 | 6 |
| 232 | Baked Beans | 100 | 3 | 6.32 | 10.57 | 4.83 | 20.00 | |
| | Cabbage and Carrot Salad | 100 | 1.5 | 1.16 | .72 | 1.33 | 1.67 | 3 |
| | Peanut Butter, Honey Sandwich | 100 | 2.5 | 11.16 | 11.43 | 4.33 | 10.83 | |
| | Banana Custard | 100 | 2 | 4.32 | 4.57 | 5.26 | 3.33 | |
| | Milk | 81 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | |
| | Orange Juice | 80 | 5 | 1.92 | 1.00 | .92 | 2.50 | |
| | Total | - | 22.0 | 31.08 | 39.57 | 39.00 | 40.00 | 5 |
| 233 | Creamed Potatoes | 190 | 4 | 7.00 | 5.29 | 3.50 | 8.33 | |
| | Spam | 250 | 1 | 4.48 | 7.29 | .50 | 6.67 | |
| | Carrots, Raw | 200 | .5 | .24 | .28 | .50 | .83 | 3 |
| | Peanut Butter, Margarine Sandwich | 260 | 1.5 | 6.24 | 7.29 | 2.92 | 6.67 | |
| | Pears, canned | 250 | 2 | 1.52 | .14 | .33 | .83 | |
| | Spice Cake | 216 | 2.5 | 8.88 | 4.14 | 1.75 | 5.00 | |
| | Milk | 197 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | |
| | Orange and Grapefruit Juice | 240 | 5 | 2.20 | 1.14 | 1.00 | 2.50 | |
| | Total | - | 24.5 | 36.76 | 36.85 | 32.83 | 32.50 | 5 |
| 234 | Navy Beans | 300 | 4 | 7.72 | 11.71 | 7.00 | 25.83 | |
| | Hard Cooked Eggs | 260 | .5 | 1.32 | 2.57 | .67 | 3.33 | |
| | Salad Dressing | 260 | .1 | | | | | |
| | Cheese, Cheddar, Processed | 250 | 1 | 4.20 | 9.43 | 15.91 | 2.50 | |
| | Carrots, Raw | 260 | 1 | .48 | .43 | .92 | 1.67 | 7 |
| | Peanut Butter Sandwich | 350 | 2 | 7.20 | 8.00 | 2.83 | 6.67 | |
| | Apple Sauce | 290 | 3 | 3.12 | .28 | .25 | 2.50 | |
| | Milk | 250 | 6 | 4.64 | 8.43 | 16.75 | .83 | |
| | Orange Juice | 275 | 4 | 2.08 | .86 | .75 | 1.67 | |
| | Total | - | 21.6 | 30.76 | 41.71 | 45.08 | 45.00 | 10 |

20 (Continued)

| Iron % | Vitamin A Value % | Thiamine % | Riboflavin % | Niacin % | Ascorbic Acid % | Time for Preparation Min. | Cost of Food Purchased | Value of U.S.D.A. Com. |
|---|---|---|---|---|---|---|---|---|
| 20.84 | 3.20 | 7.50 | 10.56 | 42.50 | 1.33 | .50 | $ .090 | $ - |
| 5.83 | 1.09 | 9.16 | 3.89 | 9.17 | 21.33 | 1.16 | .002 | .008 |
| 3.33 | 47.47 | 3.33 | 2.22 | 1.67 | 20.00 | .71 | .009 | .003 |
| 5.83 | 3.62 | 6.67 | 3.33 | 23.33 | 0 | .47 | .012 | .009 |
| .83 | 1.00 | 1.67 | .55 | .83 | 2.67 | .16 | .008 | - |
| 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .0475 | - |
| 38.33 | 64.38 | 35.00 | 42.22 | 80.00 | 49.33 | 3.00 | .1685 | .020 |
| 20.00 | 3.22 | 20.00 | 4.44 | 7.50 | 4.00 | .32 | .020 | - |
| 1.67 | 33.22 | 1.67 | 1.11 | .83 | 16.00 | .55 | .005 | .0003 |
| 10.83 | 3.47 | 11.66 | 5.00 | 29.16 | 0 | .84 | .018 | .010 |
| 3.33 | 5.33 | 3.33 | 6.67 | 1.67 | 8.00 | 1.17 | .020 | .007 |
| 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .037 | - |
| 2.50 | 1.33 | 5.00 | 1.11 | 1.67 | 60.00 | .12 | - | .024 |
| 40.00 | 54.57 | 48.33 | 40.00 | 43.33 | 92.00 | 3.00 | .100 | .0413 |
| 8.33 | 5.38 | 13.34 | 5.00 | 13.34 | 29.33 | 1.53 | .017 | .001 |
| 6.67 | 0 | 9.16 | 3.89 | 7.50 | 0 | .32 | .058 | - |
| .83 | 38.09 | .83 | .56 | .83 | 1.33 | .15 | .005 | - |
| 6.67 | 2.55 | 7.50 | 3.33 | 20.00 | 0 | .35 | .018 | .007 |
| .83 | .04 | 0 | .55 | .83 | 1.33 | .04 | .035 | - |
| 5.00 | 1.60 | 6.67 | 3.89 | 4.16 | 2.67 | .20 | .025 | .007 |
| 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .045 | - |
| 2.50 | 1.96 | 5.83 | 1.11 | 1.67 | 60.00 | .08 | .0004 | .019 |
| 32.50 | 57.62 | 50.00 | 40.00 | 50.83 | 98.66 | 2.67 | .203 | .034 |
| 25.83 | 3.35 | 21.67 | 5.00 | 6.66 | 1.33 | .91 | .022 | - |
| 3.33 | 3.60 | .83 | 2.22 | 0 | 0 | .05 | .021 | - |
| 2.50 | 8.20 | 0 | 6.67 | 0 | 0 | 0 | - | .030 |
| 1.67 | 76.18 | 1.67 | 1.11 | 1.67 | 2.67 | .48 | .007 | - |
| 6.67 | 2.80 | 7.50 | 3.33 | 20.83 | 0 | .50 | .014 | .007 |
| 2.50 | .60 | .83 | .56 | 0 | 1.33 | .12 | .001 | .022 |
| .83 | 6.00 | 5.00 | 16.11 | 1.67 | 2.67 | 0 | .040 | - |
| 1.67 | 1.60 | 4.17 | .55 | 1.67 | 40.00 | .09 | .001 | .003 |
| 45.00 | 102.33 | 41.67 | 35.55 | 32.50 | 48.00 | 2.15 | .106 | .062 |

Table 20 (Conti

| School | Menu Items | Portions Prepared No. | Standard Portion Oz. | Food Energy % | Protein % | Calcium % | Iron % | Vi A |
|---|---|---|---|---|---|---|---|---|
| 235 | Baked Beef Hash | 220 | 5 | 9.80 | 19.86 | 17.92 | 20.83 | |
| | Breaded Tomatoes | 200 | 1.5 | 1.08 | 1.43 | .83 | 2.50 | |
| | Carrot Sticks | 215 | 1 | .48 | .43 | .92 | 1.67 | 7 |
| | Peanut Butter Sandwich | 300 | 1.25 | 5.08 | 5.00 | 2.25 | 5.00 | |
| | Chocolate Pudding | 200 | 2.5 | 4.68 | 3.14 | 6.00 | .83 | |
| | Milk | 180 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | |
| | Orange and Grapefruit Juice | 250 | 2 | .92 | .43 | .33 | .83 | |
| | Total | - | 21.25 | 28.24 | 41.57 | 50.58 | 33.33 | 9 |
| 236 | Cheese | 136 | 1 | 4.20 | 9.43 | 15.92 | 2.50 | |
| | Creamed Potatoes | 450 | 3.67 | 4.08 | 3.71 | 2.67 | 5.83 | |
| | Gelatin Vegetable Salad | 150 | 2.67 | .92 | 1.71 | 1.00 | 1.67 | |
| | Bread and Butter | 280 | 1 | 3.84 | 3.58 | 2.08 | 5.00 | |
| | Ginger Bread | 150 | 1 | 4.68 | 2.29 | 2.67 | 8.33 | |
| | Milk | 120 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | |
| | Total | - | 17.34 | 23.92 | 32.00 | 46.67 | 25.00 | |
| 237 | Macaroni and Cheese | 140 | 4 | 9.04 | 12.14 | 13.50 | 5.00 | |
| | Harvard Beets | 140 | 2 | .88 | .71 | .67 | 2.50 | |
| | Peanut Butter and Fruit Sandwich | 220 | 1.5 | 8.52 | 7.44 | 3.08 | 7.50 | |
| | Plums, canned | 130 | 2.5 | 2.04 | .43 | .42 | 5.83 | |
| | Frosted Graham Cracker | 168 | 1 | 4.84 | 2.29 | .50 | 3.33 | |
| | Milk | 94 | 8 | 6.20 | 11.28 | 22.33 | 1.67 | |
| | Orange Juice | 140 | 3 | 1.12 | .71 | .58 | 1.67 | |
| | Total | - | 22.00 | 32.64 | 35.00 | 41.08 | 27.50 | |
| 238 | Creamed Chicken | 250 | 2.5 | 6.36 | 13.00 | 4.67 | 6.67 | |
| | Mashed Potatoes | 340 | 4 | 4.20 | 3.71 | 2.25 | 6.67 | |
| | Lima Beans | 200 | 2 | 1.60 | 3.14 | 1.25 | 8.33 | |
| | Parkerhouse Rolls | 240 | 1 | 5.56 | 3.71 | 1.42 | 4.16 | |
| | Margarine | 240 | .25 | | | | | |
| | Apple Crisp | 215 | 4 | 6.80 | 1.30 | .50 | 3.33 | |
| | Milk | 210 | 8 | 6.20 | 11.28 | 22.30 | 1.67 | |
| | Orange Juice | 240 | 2 | 1.08 | .71 | .58 | 1.67 | |
| | Total | - | 23.75 | 31.80 | 36.85 | 33.00 | 32.50 | |

Table 20 (Continued)

| lum | Iron % | Vitamin A Value % | Thiamine % | Riboflavin % | Niacin % | Ascorbic Acid % | Time for Preparation Min. | Cost of Food Purchased | Value of U.S.D.A. Com. |
|---|---|---|---|---|---|---|---|---|---|
| 92 | 20.83 | .33 | 15.00 | 8.33 | 35.00 | 28.00 | 1.25 | $ .041 | $ .010 |
| 83 | 2.50 | 8.73 | 3.33 | 1.11 | 3.33 | 8.00 | .15 | .003 | .023 |
| 92 | 1.67 | 76.18 | 1.67 | 1.11 | 1.67 | 2.67 | .41 | .006 | - |
| 25 | 5.00 | 3.47 | 5.83 | 2.22 | 11.67 | 0 | .32 | .013 | .0003 |
| 00 | .83 | 1.93 | 4.16 | 12.23 | 1.67 | 0 | .17 | .019 | - |
| 33 | 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .045 | - |
| 33 | .83 | .80 | 2.50 | .55 | .83 | 21.33 | .06 | - | .007 |
| 58 | 33.33 | 99.44 | 39.16 | 47.22 | 56.67 | 64.00 | 2.36 | .127 | .043 |
| 92 | 2.50 | 8.20 | 0 | 6.67 | 0 | 0 | .22 | - | .031 |
| 67 | 5.83 | 1.78 | 9.16 | 3.89 | 9.17 | 21.33 | .43 | .005 | .008 |
| 00 | 1.67 | 6.31 | 1.67 | .55 | .83 | 8.00 | .61 | .014 | - |
| 08 | 5.00 | 2.38 | 6.67 | 2.22 | 5.83 | 0 | .15 | .011 | - |
| 67 | 8.33 | .93 | 4.16 | 2.22 | 3.33 | 0 | .57 | .013 | .002 |
| 33 | 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .045 | - |
| 67 | 25.00 | 27.60 | 28.33 | 37.22 | 21.66 | 33.33 | 1.98 | .088 | .041 |
| 50 | 5.00 | 9.69 | 3.33 | 8.34 | 5.00 | 0 | .83 | .023 | .019 |
| 67 | 2.50 | .35 | 0 | .55 | .83 | 2.67 | .20 | .016 | - |
| 08 | 7.50 | 4.53 | 8.33 | 3.89 | 17.50 | - | 1.19 | .018 | .009 |
| 42 | 5.83 | 3.44 | 1.67 | 1.11 | 1.67 | 1.33 | .15 | .021 | - |
| 50 | 3.33 | 1.56 | 5.00 | 1.11 | - | - | .38 | .017 | - |
| 33 | 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .050 | - |
| 38 | 1.67 | 1.38 | 3.33 | .55 | .83 | 36.00 | .11 | - | .012 |
| 08 | 27.50 | 28.95 | 28.33 | 37.22 | 28.33 | 44.00 | 2.86 | .145 | .040 |
| 67 | 6.67 | .04 | 6.67 | 8.89 | 29.17 | 0 | .52 | .037 | .001 |
| 25 | 6.67 | 1.60 | 10.00 | 3.34 | 10.00 | 24.00 | .61 | .002 | .010 |
| 25 | 8.33 | 1.65 | 1.67 | 1.11 | 2.50 | 5.33 | .07 | .024 | - |
| 42 | 4.16 | 5.20 | 5.83 | 2.22 | 5.00 | 0 | .14 | .020 | - |
| 50 | 3.33 | 3.11 | 3.33 | 2.22 | 3.33 | 4.00 | .40 | .010 | .011 |
| 00 | 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .040 | - |
| 38 | 1.67 | 1.35 | 3.33 | .55 | .83 | 34.67 | .02 | - | .008 |
| 00 | 32.50 | 20.95 | 37.50 | 40.00 | 53.33 | 72.00 | 1.76 | .133 | .030 |

Table 20 (Co

| School | Menu Items | Portions Prepared No. | Standard Portion Oz. | Food Energy % | Protein % | Calcium % | Iron % |
|---|---|---|---|---|---|---|---|
| 239 | Data Not Available | | | | | | |
| 2310 | Meat Loaf | 150 | 3 | 7.68 | 15.71 | 1.25 | 14.17 |
| | Creamed Peas | 200 | 2 | 2.48 | 3.43 | 1.75 | 8.33 |
| | Carrot Sticks | 160 | .25 | .12 | .14 | .25 | .83 |
| | Bread, Home Made | 200 | 1 | 5.56 | 3.28 | 1.33 | 4.17 |
| | Margarine | 130 | .25 | | | | |
| | Peaches, canned | 150 | 2 | 1.52 | .29 | .25 | 1.67 |
| | Chocolate Ice Box Cooky | 130 | .5 | 3.04 | 1.00 | .33 | .83 |
| | Milk, Bulk, Raw | 130 | 6 | 4.64 | 8.43 | 16.75 | .83 |
| | Orange and Grapefruit Juice | 140 | 3 | .10 | .57 | .59 | 1.67 |
| | Total | - | 18.00 | 25.14 | 32.85 | 22.50 | 32.50 |
| 2311 | Creole Spaghetti | 150 | 3 | 9.28 | 19.43 | 6.08 | 16.67 |
| | Cole Slaw | 140 | 2.5 | 2.04 | 1.43 | 2.76 | 3.33 |
| | Bread and Butter Sandwich | 170 | 1.125 | 4.80 | 3.71 | 2.08 | 4.17 |
| | Applesauce Cake and Icing | 160 | 3 | 7.12 | 1.86 | .92 | 3.33 |
| | Milk | 125 | 8 | 6.20 | 11.28 | 22.33 | 1.67 |
| | Orange and Grapefruit Juice | 140 | 2 | .60 | .43 | .33 | .83 |
| | Total | - | 19.63 | 30.04 | 38.14 | 34.50 | 30.00 |
| 2312 | Noodles | 272 | 3 | 6.04 | 13.14 | .50 | 10.00 |
| | Beef | 352 | 1 | | | | |
| | Mashed Potatoes | 320 | 5 | 6.34 | 5.57 | 4.42 | 8.33 |
| | Cabbage Salad | 238 | 2 | 2.00 | 1.44 | 2.58 | 2.50 |
| | Bread and Butter Sandwich | 400 | 1.25 | 5.60 | 4.14 | 2.33 | 5.00 |
| | Fruit Gelatin | 248 | 2.5 | 1.80 | 1.14 | .25 | 1.67 |
| | Milk | 200 | 8 | 6.20 | 11.28 | 22.33 | 1.67 |
| | Total | - | 22.75 | 28.00 | 36.71 | 32.41 | 29.17 |
| 2313 | Cheese | 160 | 1 | 4.20 | 9.43 | 15.91 | 2.50 |
| | Baked Potato | 190 | 3 | 6.48 | 2.14 | .92 | 4.17 |
| | Margarine | 180 | .5 | | | | |
| | Green Beans | 190 | 3 | 1.64 | 1.14 | 1.92 | 10.00 |
| | Bread - Margarine | 290 | 1 | 4.24 | 2.71 | 1.58 | 3.33 |
| | Peaches, canned | 200 | 3 | 2.92 | .43 | .33 | 2.50 |
| | Peanut Butter Cooky | 200 | .75 | 3.40 | 3.58 | 1.00 | 3.33 |
| | Milk | 150 | 8 | 6.20 | 11.28 | 22.33 | 1.67 |
| | Orange Juice | 73 | 3 | 2.04 | .72 | .59 | 1.67 |
| | Total | - | 23.25 | 31.12 | 31.43 | 44.58 | 29.17 |

ble 20 (Continued)

| Iron % | Vitamin A Value % | Thiamine % | Riboflavin % | Niacin % | Ascorbic Acid % | Time for Preparation Min. | Cost of Food Purchased | Value of U.S.D.A. Com. |
|---|---|---|---|---|---|---|---|---|
| 14.17 | 5.60 | 5.83 | 6.12 | 20.84 | 6.60 | .59 | $ .067 | $ .008 |
| 8.33 | 8.53 | 6.67 | 2.78 | 5.83 | 6.66 | .80 | .019 | - |
| .83 | 18.72 | 0 | 0 | 0 | 0 | .30 | .001 | - |
| 4.17 | 5.51 | 6.67 | 3.89 | 8.33 | 0 | .10 | .007 | - |
| | | | | | | | .007 | - |
| 1.67 | 5.71 | - | .55 | 3.33 | 2.67 | .03 | .022 | .002 |
| .83 | .24 | .83 | .55 | .83 | - | .09 | .006 | - |
| .83 | 6.00 | 5.00 | 16.11 | 1.67 | 2.67 | 0 | .028 | .011 |
| 1.67 | 1.09 | 3.33 | .55 | .83 | 32.00 | .17 | - | - |
| 32.50 | 51.40 | 28.33 | 30.55 | 41.66 | 50.66 | 2.08 | .157 | .021 |
| 16.67 | 16.47 | 2.50 | 7.78 | 24.17 | 14.67 | .75 | .076 | .030 |
| 3.33 | 41.18 | 3.33 | 2.22 | 2.50 | 40.00 | .40 | .014 | - |
| 4.17 | 3.89 | 5.83 | 2.78 | 5.83 | 0 | .04 | .015 | - |
| 3.33 | 1.42 | 1.67 | 1.11 | .83 | 1.33 | .33 | .011 | .008 |
| 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .0475 | - |
| .83 | .64 | 1.67 | .55 | .83 | 18.66 | .08 | - | .008 |
| 30.00 | 71.60 | 21.67 | 36.11 | 36.66 | 78.66 | 1.60 | .1635 | .046 |
| 10.00 | .64 | 3.33 | 3.89 | 12.50 | 0 | .35 | .004 | - |
| | | | | | | .07 | .061 | - |
| 8.33 | 3.84 | 13.33 | 6.11 | 14.16 | 32.00 | .65 | .006 | .013 |
| 2.50 | 1.36 | 2.50 | 2.22 | 1.67 | 30.67 | .52 | .020 | - |
| 5.00 | 4.80 | 6.67 | 2.78 | 5.83 | 0 | .04 | .018 | - |
| 1.67 | 3.20 | .83 | .55 | 1.67 | 4.00 | .34 | .016 | - |
| 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .050 | - |
| 29.17 | 21.84 | 33.33 | 37.22 | 38.33 | 70.67 | 1.97 | .175 | .013 |
| 2.50 | 8.20 | 0 | 6.66 | 0 | 0 | .23 | - | .032 |
| 4.17 | 10.71 | 5.83 | 1.67 | 6.67 | 16.00 | 1.05 | - | .007 |
| | | | | | | | .010 | - |
| 10.00 | 10.24 | 2.50 | 2.22 | 1.67 | 4.00 | .005 | .028 | - |
| 3.33 | 4.55 | 4.17 | 1.67 | 4.17 | 0 | .37 | .015 | - |
| 2.50 | 8.58 | .83 | 1.11 | 5.00 | 5.33 | .10 | .033 | - |
| 3.33 | .78 | 2.50 | 1.67 | 9.16 | - | .65 | .002 | .007 |
| 1.67 | 8.00 | 6.67 | 21.67 | 2.50 | 4.00 | 0 | .035 | - |
| 1.67 | 1.38 | 3.33 | .55 | .83 | 34.67 | .15 | .001 | .012 |
| 29.17 | 52.44 | 25.83 | 37.22 | 30.00 | 64.00 | 2.46 | .124 | .058 |

# APPENDIX E. STATISTICAL ANALYSES

Table 21. Data Used for Estimating Sample Size for Further Management Studies

| | $s^2$ [a] | t | d [b] | | $n_o$ [c] | n |
|---|---|---|---|---|---|---|
| High schools, N = 67 | | | | | | |
| Labor time | 7.7 | 2 | .25 | min. | 492.8 | 59 |
| Kitchen area | 8.8 | 2 | .5 | sq.ft. | 140.8 | 45 |
| Dining room area | 25 | 2 | 1 | sq.ft. | 100 | 40 |
| Dining table area | .88 | 2 | .1 | sq.ft. | 352 | 58 |
| Food cost | 56.9 | 2 | .5 | cent | 910.4 | 62 |
| Labor cost | 31.6 | 2 | .5 | cent | 505.6 | 59 |
| Other costs | 16.3 | 2 | .5 | cent | 260.8 | 53 |
| Total cost | 13.9 | 2 | .25 | cent | 889.6 | 64 |
| Elementary schools, N = 30 | | | | | | |
| Labor time | 8.7 | 2 | .25 | min. | 556.8 | 28 |
| Kitchen area | .65 | 2 | .5 | sq.ft. | 10.4 | 8 |
| Dining room area | 7.8 | 2 | 1 | sq.ft. | 30.8 | 15 |
| Dining table area | .15 | 2 | .1 | sq.ft. | 60 | 20 |
| Food cost | 16.3 | 2 | .5 | cent | 260.8 | 27 |
| Labor cost | 10.9 | 2 | .5 | cent | 174.4 | 30 |
| Other costs | 4 | 2 | .5 | cent | 64 | 21 |
| Total cost | 5.4 | 2 | .25 | cent | 345.6 | 28 |
| Schools with 12 grades, N = 525 | | | | | | |
| Labor time | 2.3 | 2 | .25 | min. | 147.2 | 115 |
| Kitchen area | 1.2 | 2 | .5 | sq.ft. | 19.2 | 19 |
| Dining room area | 5 | 2 | 1 | sq.ft. | 20 | 19 |
| Dining table area | .17 | 2 | .1 | sq.ft. | 68 | 60 |
| Food cost | 5.9 | 2 | .5 | cent | 94.4 | 80 |
| Labor cost | 2.8 | 2 | .5 | cent | 448 | 41 |
| Other costs | 1.9 | 2 | .5 | cent | 30.4 | 28 |
| Total cost | .8 | 2 | .25 | cent | 51.2 | 47 |

[a] $s^2$ = variance

[b] d = one half of the confidence interval

[c] $n_o = \frac{t^2 s^2}{d^2}$

[d] $n = \frac{n_o}{= + \frac{n_o}{N}}$

Table 22. Analysis of Covariance of the Daily Labor Time Scheduled for School Lunch Personnel in Three Groups of Iowa Schools During the School Year 1948-49

| Source of Variation | Degrees of Freedom | Errors of Estimate | | | F |
|---|---|---|---|---|---|
| | | Sums of Squares | Degrees of Freedom | Mean Square | |
| Total schools | 24 | 969.2567 | 23 | | |
| Within groups | 22 | 359.2697 | 21 | 17.1081 | |
| Adjusted means | 2 | 609.9870 | 2 | 304.9935 | 17.83** |

Table 23. Analysis of Covariance of the Kitchen Area in Three Groups of Iowa Schools During the School Year 1948-49

| Source of Variation | Degrees of Freedom | Errors of Estimate | | | F |
|---|---|---|---|---|---|
| | | Sums of Squares | Degrees of Freedom | Mean Square | |
| Total schools | 24 | 1,681,563 | 23 | | |
| Within groups | 22 | 817,537 | 21 | 38,930 | |
| Adjusted means | 2 | 864,026 | 2 | 432,013 | 11.10** |

Table 24. Analysis of Covariance of the Dining Room Area in Three Groups of Iowa Schools During the School Year 1948-49

| Source of Variation | Degrees of Freedom | Errors of Estimate | | | F |
|---|---|---|---|---|---|
| | | Sums of Squares | Degrees of Freedom | Mean Square | |
| Total schools | 24 | 6,220,760 | 23 | | |
| Within groups | 22 | 5,405,108 | 21 | 257,386 | |
| Adjusted means | 2 | 815,654 | 2 | 407,827 | 1.58 |

**Highly significant; probability exceeds 1% level

Table 25. Analysis of Covariance of the Dining Table Area in Three Groups of Iowa Schools During the School Year 1948-49

| Source of Variation | Degrees of Freedom | Errors of Estimate | | | F |
|---|---|---|---|---|---|
| | | Sums of Squares | Degrees of Freedom | Mean Square | |
| Total schools | 24 | 497,439 | 23 | | |
| Within groups | 22 | 271,707 | 21 | 12,938 | |
| Adjusted means | 2 | 225,732 | 2 | 112,866 | 8.72** |

Table 26. Analysis of Covariance of Total Costs in Three Groups of Iowa Schools During the School Year 1948-49

| Source of Variation | Degrees of Freedom | Errors of Estimate | | | F |
|---|---|---|---|---|---|
| | | Sums of Squares | Degrees of Freedom | Mean Squares | |
| Total schools | 21 | 196,971,301 | 20 | | |
| Within groups | 19 | 105,487,377 | 18 | 5,860,410 | |
| Adjusted means | 2 | 91,483,924 | 2 | 45,741,962 | 7.81** |

Table 27. Analysis of Covariance of Food Cost in Three Groups of Iowa Schools During the School Year 1948-49

| Source of Variation | Degrees of Freedom | Errors of Estimate | | | F |
|---|---|---|---|---|---|
| | | Sums of Squares | Degrees of Freedom | Mean Square | |
| Total schools | 21 | 88,778,747 | 20 | | |
| Within groups | 19 | 76,301,896 | 18 | 4,238,994 | |
| | 2 | 12,476,851 | 2 | 6,238,426 | 1.47 |

**Highly significant; probability exceeds 1% level

Table 28. Analysis of Covariance of Labor Cost in Three Groups of Iowa Schools During the School Year 1948-49

| Source of Variation | Degrees of Freedom | Errors of Estimate | | | F |
|---|---|---|---|---|---|
| | | Sums of squares | Degrees of Freedom | Mean Square | |
| Total schools | 21 | 18,832,388 | 20 | 941,619 | |
| Within groups | 19 | 12,336,019 | 18 | 685,334 | |
| Adjusted means | 2 | 6,496,369 | 2 | 3,248,185 | 4.74* |

Table 29. Analysis of Covariance of Other Costs in Three Groups of Iowa Schools During the School Year 1948-49

| Source of Variation | Degrees of Freedom | Errors of Estimate | | | F |
|---|---|---|---|---|---|
| | | Sums of Squares | Degrees of Freedom | Mean Squares | |
| Total schools | 21 | 14,002,686 | 20 | | |
| Within groups | 19 | 6,356,850 | 18 | 353,158 | |
| Adjusted means | 2 | 7,645,836 | 2 | 3,822,918 | 10.82** |

*Significant; probability between 5% and 1% level

**Highly significant; probability exceeds 1% level

# APPENDIX F. EDUCATIONAL PRACTICES OF SCHOOL LUNCH PROGRAMS CLASSIFIED ACCORDING TO THE SIX PROPOSED CRITERIA

## There are Sound Policies for the Administration of the School Lunch Program

1. The school administrator is responsible for the administration of the lunch program.

2. The lunchroom provides possibilities for all pupils to improve dietary habits, social behavior and citizenship:

   a. Lunch is available to all students
   b. School lunch facilities are available to those who bring their lunch
   c. Adequate time is scheduled for the lunch
   d. Adequate dining space and facilities are provided.

3. Teachers are encouraged to assume and share responsibilities for promoting the educational effectiveness of the program by:

   a. Cooperating in developing school lunch policies
   b. Assisting in supervising various phases of the lunch program
   c. Correlating the school lunch program with class activities
   d. Assisting in an evaluation program.

4. Pupils are encouraged to participate in educational activities related to the school lunch program by giving them opportunities to:

   a. Cooperate in developing school lunch policies
   b. Plan school lunch projects
   c. Assume some responsibilities for the operation of the school lunch
   d. Assist in an evaluation program.

5. The contribution of the professionally trained manager and the school lunch personnel to the educational effectiveness of the lunch program is recognized by:

a. Employing those interested in the educational possibilities of the program
b. Encouraging them to cooperate in proposing policies for the lunch program
c. Giving them the opportunity to cooperate in planning school lunch projects with pupils
d. Encouraging the personnel to supervise pupils in work experiences in the lunch room
e. Encouraging the personnel to give guidance during the lunch period
f. Giving the manager and the personnel the opportunity to cooperate in planning the correlation of the school lunch program with class activities
g. Giving the manager and the personnel an opportunity to assist in an evaluation program
h. Giving the personnel an opportunity for further training.

6. Community members are encouraged to participate in the school lunch program by giving them opportunities to:

a. Propose policies for the school lunch program
b. Cooperate in interpreting policies to other members of the community
c. Increase the availability of community resources to the school lunch program
d. Assist in an evaluating program.

7. The school lunch program is interpreted to the community through:

a. Newspapers
b. Information sent to parents
c. Encouraging parents to visit the school lunch
d. Community meetings
e. Radio.

8. Management and educational aspects of the school lunch program are evaluated periodically to:

a. Show existing conditions
b. Clarify objectives
c. Serve as a guide for planning an improved program
d. Other.

## The School Administrator Assumes Responsibility for the Administration of the School Lunch Program

1. He promotes the continued functioning of a policy formulating group.

2. Provides opportunities for teachers, pupils, the professionally trained manager, school lunch personnel and community members to participate in developing school lunch policies.

3. Delegates responsibilities for various phases of the lunch program according to the policies proposed and approved by the groups concerned.

4. Promotes the interpretation of the objectives and policies of the school lunch program to teachers, pupils, school lunch manager, school personnel and community members.

5. Stimulates the interest of teachers, the school lunch manager and school lunch personnel in correlating the school lunch program with class activities.

6. Proposes and directs an evaluation program.

## Teachers Assume and Share Responsibilities for Promoting the Educational Effectiveness of the School Lunch Program

1. They cooperate in developing policies for the school lunch program by:

    a. Representation on a policy formulating group
    b. Direct contact with the school administrator
    c. Direct contact with school personnel
    d. Other.

2. Assist in supervision:

    a. During the school lunch period to provide:
        1. Guidance in social behavior
        2. Guidance in citizenship
        3. Guidance in improving food habits
        4. Other.
    b. Of student planned projects.

c. Of those aspects of the school lunch program to which they contribute their special training and experience
   1. Home economics teacher: menu planning
      food buying
      management
      equipment buying
      other
   2. Commercial teacher: collect money
      keep records
      figure costs
      make monthly reports
      type menus and reports
      other
   3. Art teacher: posters
      improve appearance of dining room
      other
   4. Agriculture or shops teachers: food production
      make new equipment
      repair and service equipment
      other
   5. Other.

3. Correlate the school lunch program with class activities by guiding students in planning class projects to:

   a. Consider possible sources of food supplies for the lunch program
      1. Compare wholesale, retail, local markets
      2. Compare methods of buying such as cash, charge, wholesale, retail
      3. Survey community for excess garden products which could be used for the school lunch program
      4. Study foods available in the community
      5. Study foods that must be shipped into the community
      6. Plan school gardens
      7. Conduct food preservation program
      8. Study contributions in terms of nutrition and cash value of available federal commodities
      9. Other.

   b. Plan menus for the school lunch program considering:
      1. Foods available in the community
      2. Abundant foods suggested by the Production and Marketing Administration
      3. Federal commodities distributed to the school

4. Introduction of foods not previously served
5. Nutritional adequacy
6. Cost of food
7. Food combinations such as flavor, texture, color, shape, consistency, appearance
8. Equipment and facilities
9. Personnel
10. Other.

c. Improve the appearance and facilities of the school lunch room by:
   1. Conducting survey to determine: amount of storage space; conditions for storage; arrangement and convenience of dining room area, preparation area, serving area
   2. Making recommendations for improvement of: storage space; conditions of storage; arrangement of dining room area, preparation area, serving area
   3. Improving the: storage space; conditions of storage; arrangement of dining area, preparation area, serving area
   4. Improving the facilities and appearance of the dining room by: constructing equipment; refinishing equipment; painting walls; making curtains; displaying flowers, food, and other special holiday decorations; selecting and hanging pictures
   5. Servicing and repairing equipment
   6. Other.

d. Improve eating habits in the school lunch room by:
   1. Surveying: breakfast and dinner food habits as a basis for what is required at lunch
      kinds of foods returned
      amounts of food returned
      cost analysis of food returned
      nutritional analysis of food returned
      other
   2. Demonstrating:
      effects of lack of rejected foods
      using animal feeding experiments
      other
   3. Interpreting:
      results of surveys and analysis
      discussion in assembly, home room
      newspaper articles
      posters
      other
   4. Other.

e. Improve social behavior in the school lunch room by:
   1. Surveying existing practices:
      table manners
      general lunch room etiquette
   2. Interpreting accepted lunch room etiquette to the school by:
      present demonstrations
      conduct discussions in home rooms or assembly
      plan for student hosts and hostesses
      entertain guests periodically
      help younger children
      other
   3. Other.

f. Provide citizenship training in the school lunch room by:
   1. Surveying existing procedures and practices:
      in serving line
      when returning trays and scraping plates
      in accepting responsibilities for keeping the room neat and clean
   2. Interpreting accepted practices:
      prepare directions for student conduct and responsibilities
      help younger children
      help new students
      other
   3. Other.

g. Assist with problems in food preparation and utilization by:
   1. Suggesting ways of using:
      abundant food
      federal commodities
      available, economical, nutritious foods
   2. Assisting in food preparation
   3. Observing food preparation and recommending methods of retaining food value
   4. Other.

h. Assist with problems in food service by:
   1. Helping in the actual food service
   2. Surveying food service procedure:
      arranging counter
      portioning food
   3. Making recommendations based on the survey
   4. Other.

i. Apply sanitation principles and regulations to the school lunch kitchen and dining room by:
   1. Surveying methods of distribution at serving counter
   2. Suggesting sanitary methods of distribution of silver, straws and sandwiches
   3. Studying efficiency of cleaning supplies and making recommendations
   4. Surveying:
      state and community sanitary regulations for food service units
      application of regulations to dishwashing methods
      provision for washing hands before and after eating
      milk service
      garbage and waste disposal
      insect and rodent control
      food storage
      personnel
      other
   5. Making recommendation for improvement in sanitation practices
   6. Other.

j. Provide secretarial service for the school lunch program by:
   1. Typing menus
   2. Preparing monthly reports

3. Mimeographing or typing forms for:
   - inventories
   - records of income and expense
   - other food cost records
   - other
4. Other.

k. Assist with financial control by:
1. Taking inventories and extending the costs
2. Keeping daily food cost records
3. Keeping daily income records
4. Checking meal tickets or collecting cash
5. Calculating cost of recipes used in the lunch room
6. Preparing profit and loss statements
7. Studying costs and income to show how income is distributed to cover costs
8. Other.

l. Interpret the school lunch program to the school by:
1. Printing articles in the school newspaper about:
   - personnel
   - new policies and procedures
   - objectives of the program
   - menus
   - recipes
   - other
2. Posting cartoons and displays
   - promote campaigns
   - interpret policies
3. Posting menus
4. Conducting discussions in homerooms
5. Conducting discussions in general assembly
6. Describing the school lunch objectives and procedures in a booklet to be distributed
7. Other.

m. Interpret the school lunch program to the community by:
1. Sending copies of the menus to parents
2. Printing information in the community newspaper about:
   - personnel
   - new policies and procedures
   - objectives of the lunch program
   - menus
   - recipes
   - other
3. Participating in radio programs

4. Describing the school lunch objectives and procedures in a booklet to be distributed
5. Other.

4. Assist in an evaluation of the school lunch program by:

a. Periodically surveying the food consumed and returned
b. Surveying reaction to foods served
c. Surveying social behavior and citizenship
d. Other.

Pupils Participate in Educational Activities Related to the School Lunch Program

1. They cooperate in proposing school lunch policies by:

a. Representation on a policy formulating group
b. Direct contact with school administrator
c. Direct contact with school lunch personnel
d. Other.

2. Plan and carry out educational projects to:

a. Interpret the school lunch program to others by:
   1. Sending recipes and menus home
   2. Printing menus and recipes in the school paper
   3. Printing menus and recipes in the community paper
   4. Participating in radio programs
   5. Other.

b. Improving dietary habits by:
   1. Surveying food habits of students
   2. Surveying kinds and amounts of food returned
   3. Other.

c. Provide guidance in social behavior by:
   1. Acting as hosts and hostesses
   2. Entertaining guests
   3. Helping younger children
   4. Directing new students
   5. Suggesting correct table manners and accepted lunchroom etiquette
   6. Other.

d. Provide guidance in citizenship in the school lunch room by:

1. Helping supervise tray line and tray return lines
2. Suggesting accepted behavior while waiting in line
3. Directing new students
4. Suggesting responsibilities for keeping dining room clean and in order
5. Other.

e. Improve the appearance of the school lunchroom by:
   1. Refinishing dining room equipment
   2. Decorating the dining room:
      paint walls
      make curtains
      display flowers, food, and other special holiday decorations
      select and hang pictures
      make posters
      other
   3. Other.

f. Improve the facilities of the school lunchroom by:
   1. Constructing equipment
   2. Earning money for new equipment
   3. Repairing and servicing equipment
   4. Refinishing equipment
   5. Other.

g. Evaluate the school lunch program by:
   1. Conducting surveys of dietary habits of students in the lunch room:
      reaction to foods served
      amount and kinds of food returned
   2. Conducting surveys of social behavior and citizenship
   3. Other.

3. Assume some responsibilities for the operation of the lunch program by:

   a. Preparing food
   b. Serving
   c. Cleaning
   d. Checking meal tickets
   e. Collecting money
   f. Other.

The Professionally Trained Manager and the School Lunch Personnel Contribute to the Educational Effectiveness of the School Lunch Program

1. The professionally trained manager or in schools with no managers the personnel cooperates in proposing policies for the school lunch program

   a. As a member of the policy formulating group
   b. By direct contact with the school administrator
   c. By direct contact with the community advisory group
   d. Other.

2. Cooperates in planning school lunch projects planned by the pupils to:

   a. Improve food habits
   b. Improve appearance of the lunch room
   c. Improve equipment
   d. Interpret the school lunch program to the school and community
   e. Improve social behavior in the lunch room
   f. Improve citizenship in the lunch room
   g. Other.

3. Supervises pupils in work experiences such as:
   a. Preparing food
   b. Serving food
   c. Cleaning
   d. Checking meal tickets
   e. Collecting money
   f. Other.

4. Gives guidance during the serving period by:

   a. Suggesting trial of new foods
   b. Suggesting that pupils eat some of each food served
   c. Answering questions about food
   d. Serving new foods in small amounts
   e. Urging the pupils to drink milk
   f. Displaying posters
   g. Other.

5. Cooperates in planning the correlation of the school lunch program with class activities to:

   a. Consider possible sources of food supply
   b. Plan menus
   c. Improve appearance and facilities of the dining room

d. Improve eating habits in the lunch room
e. Improve social behavior
f. Provide citizenship training
g. Assist with problems in food preparation and utilization
h. Assist with problems of food service
i. Apply sanitation principles and regulations
j. Provide secretarial service
k. Assist with financial control
l. Interpret the school lunch program to the school and community
m. Other.

6. Assists in evaluating:
   a. Equipment
   b. Cleanliness
   c. Costs
   d. Menus
   e. Amounts and kind of food returned and consumed
   f. Other.

7. Attends training courses or conferences for school lunch personnel.

Community Members Participate in the School Lunch Program

1. They propose policies for the school lunch program by:

   a. Direct contact with the school administrator
   b. Representation on the policy formulating group
   c. Direct contact with school lunch personnel
   d. Other.

2. Cooperate in interpreting policies to other members of the community in:

   a. Parent-Teacher Association meetings
   b. Other community meetings
   c. Newspaper articles
   d. Other.

3. Increase the availability of community resources to the school lunch program by:

a. Improving the facilities of the school lunch by:
   1. Acquiring equipment
   2. Constructing equipment
   3. Decorating the lunch room
   4. Other.

b. Assisting in food production and service through
   1. Food production in gardens
   2. Food preservation
   3. Food service during the lunch period
   4. Food preparation in the lunch room
   5. Cleaning
   6. Other.

4. Assist in an evaluation program by:

   a. Conducting periodic surveys of home food habits of children
   b. Observing other changes in children
   c. Observing need for changes in children
   d. Other.

# APPENDIX G. SCHEDULE FOR DETERMINING TO WHAT EXTENT THE SIX PROPOSED CRITERIA ARE FULFILLED IN A SCHOOL

Part I: There are Sound Policies for the Administration of the School Lunch Program

Information obtained from:

School administrator _____
Others responsible for the lunch program_____ _____

1. School enrollment _____

2. Average number of pupils eating in the lunch room daily _____

3. Who in this school is largely responsible for the school lunch?

| | RESPONSIBILITY |
|---|---|
| a. Administrator | _____ |
| b. Community member | _____ |
| c. School lunch manager | _____ |
| d. Other_____ | _____ |

4. Who participates in determining policies for the administration of the school lunch program?

| | PROPOSE POLICIES | ENTER INTO FINAL DECISIONS | CARRY OUT POLICIES |
|---|---|---|---|
| a. School board | _____ | _____ | _____ |
| b. School administrator | _____ | _____ | _____ |
| c. School lunch manager | _____ | _____ | _____ |
| d. School lunch personnel | _____ | _____ | _____ |
| e. School lunch committee | _____ | _____ | _____ |
| f. Pupils | _____ | _____ | _____ |
| g. Teachers | _____ | _____ | _____ |
| h. Community members | _____ | _____ | _____ |
| i. Other_____ | _____ | _____ | _____ |

5. Have you ever found it wise to have a school lunch committee for determining the policies of the school lunch program?

Yes _____
No _____
Never tried _____

If so, what groups are (or were) given the opportunity to be represented on the committee?

| GROUP | OPPORTUNITY | ARE MEMBERS | HAVE BEEN MEMBERS |
|---|---|---|---|
| a. Superintendent | _____ | _____ | _____ |
| b. Principal | _____ | _____ | _____ |
| c. Pupils | _____ | _____ | _____ |
| d. Teachers | _____ | _____ | _____ |
| e. Community | _____ | _____ | _____ |
| f. School lunch manager | _____ | _____ | _____ |
| g. School lunch personnel | _____ | _____ | _____ |
| h. Other_____ | _____ | _____ | _____ |

If you have had a committee but discontinued it, did you find it helpful in planning for and operating the school lunch?

Yes _____
No _____

Comment:

6. Who is responsible for keeping the school lunch committee functioning from year to year?

a. Superintendent _____
b. Principal _____
c. Last years chairman _____
d. School lunch manager _____
e. School lunch personnel _____
f. Other_____ _____

7. Have you thought through any objectives for the school lunch program?
   Yes _____
   No _____

   If so, what are the objectives?

   Have you found it helpful to acquaint the pupils, teachers and school lunch personnel with the objectives of the school lunch program?
   Yes _____
   No _____
   Never tried _____
   No objectives _____

   If so, how was it done?

| | METHOD |
|---|---|
| a. Pupils | _____ |
| b. Teachers | _____ |
| c. School lunch manager | _____ |
| d. School lunch personnel | _____ |

   Comment:

8. Are teachers asked to share supervisory responsibilities for the school lunch?
   Yes _____
   No _____

   If so, what responsibilities do they assume?

| | NOT ENC. | ENC. | ASSUME RESPONS. |
|---|---|---|---|
| a. Supervise during the school lunch period: | | | |
| Social behavior | _____ | _____ | _____ |
| Citizenship | _____ | _____ | _____ |
| Other_____ | _____ | _____ | _____ |
| b. Projects planned by pupil | _____ | _____ | _____ |
| c. Special responsibilities because of training and experience: | | | |
| Home economics teacher | _____ | _____ | _____ |
| Commercial teacher | _____ | _____ | _____ |
| Art teacher | _____ | _____ | _____ |
| Agriculture teacher | _____ | _____ | _____ |
| Shops teacher | _____ | _____ | _____ |
| Elementary teacher | _____ | _____ | _____ |
| Other_____ | _____ | _____ | _____ |

   Brief Description:

9. Have you found it effective to encourage teachers to correlate the school lunch with class activities?

Yes _____
No _____
Never tried _____

| | GRADE LEVEL | TEACHER |
|---|---|---|
| a. Consider possible sources of food supply | _____ | _____ |
| b. Plan menus | _____ | _____ |
| c. Improve appearance and facilities of the dining room | _____ | _____ |
| d. Improve eating habits in the lunchroom | _____ | _____ |
| e. Improve social behavior | _____ | _____ |
| f. Provide citizenship training | _____ | _____ |
| g. Assist with problems in food preparation and utilization | _____ | _____ |
| h. Assist with problems in food service | _____ | _____ |
| i. Apply sanitation principles and regulations | _____ | _____ |
| j. Provide secretarial service | _____ | _____ |
| k. Assist with financial control | _____ | _____ |
| l. Interpret the school lunch program to the school and community | _____ | _____ |
| m. Other_____ | _____ | _____ |

Brief description:

10. Do you find it wise to ask several persons to cooperate in planning for this correlation?

No correlation _____
Yes _____
No _____
Never tried _____

If so, who were encouraged to participate?

| | ENCOURAGED | PARTICIPATED |
|---|---|---|
| a. Teachers | _____ | _____ |
| b. School lunch manager | _____ | _____ |
| c. School lunch personnel | _____ | _____ |
| d. Superintendent | _____ | _____ |
| e. Principal | _____ | _____ |
| f. Other_____ | _____ | _____ |

11. Do you believe it advisable to encourage pupils to participate in the school lunch program?

Yes _____
No _____
Never tried _____

If so, how have the pupils participated?

| | NOT ENC. | ENC. | PART. |
|---|---|---|---|
| a. Pupil school lunch committee | _____ | _____ | _____ |
| b. Work experience | _____ | _____ | _____ |
| 1. Food preparation | _____ | _____ | _____ |
| 2. Serving | _____ | _____ | _____ |
| 3. Cleaning | _____ | _____ | _____ |
| 4. Checking meal tickets | _____ | _____ | _____ |
| 5. Collecting money | _____ | _____ | _____ |
| 6. Other _____ | _____ | _____ | _____ |
| c. Planned projects to: | | | |
| 1. Improve food habits | _____ | _____ | _____ |
| 2. Improve appearance of school | _____ | _____ | _____ |
| 3. Improve equipment | _____ | _____ | _____ |
| 4. Interpret school lunch program to school and community | _____ | _____ | _____ |
| 5. Improve social behavior | _____ | _____ | _____ |
| 6. Improve citizenship | _____ | _____ | _____ |
| 7. Other _____ | _____ | _____ | _____ |

Brief description:

12. Who is encouraged to help pupils plan projects?

| | ENCOURAGED | PARTICIPATE |
|---|---|---|
| a. Pupils | _____ | _____ |
| b. Advisor for pupil organizations | _____ | _____ |
| c. School lunch manager | _____ | _____ |
| d. School lunch personnel | _____ | _____ |
| e. Teachers | _____ | _____ |
| f. Other _____ | _____ | _____ |

Comment:

13. What qualifications for employment have you found it wise to require for your school lunch personnel?

| | |
|---|---|
| a. Education | _____ |
| b. Experience | _____ |
| c. Interest in children | _____ |
| d. Interest in educational possibilities of the lunch program | _____ |
| e. Physical | _____ |
| f. Ability to get along with people | _____ |
| g. Personal cleanliness | _____ |
| h. Other_____ | _____ |

Comment:

14. Have you found it possible to provide opportunities for further training for any of your school lunch personnel?

Yes _____
No _____
Never tried _____

| | OPPORTUNITY | ATTENDED | EXPENSES |
|---|---|---|---|
| a. Conference called by state school lunch supervisor | _____ | _____ | _____ |
| b. School lunch short course | _____ | _____ | _____ |
| c. Other_____ | _____ | _____ | _____ |

Comment:

15. Have you found it helpful for the school lunch personnel to encourage pupils to try new foods or give other guidance for improving food habits while they are serving the lunch?

Yes _____
No _____
Never encouraged _____

Comment:

16. Do you find it advisable to encourage the school lunch personnel to assume the responsibility for training and supervision of pupils who work in the school lunch?

Yes _____
No _____
Never encouraged _____

Comment:

17. Have you had any experiences in encouraging parents to participate in the school lunch program? Yes _____
No _____
Never tried _____

If so, in what way did they participate?
a. Organized a community advisory committee _____
b. PTA _____
c. Representative on school lunch committee _____
d. Other _____ _____

Projects:
a. Buy equipment _____
b. Construct equipment _____
c. Decorate lunch room _____
d. Produce food _____
e. Preserve food _____
f. Prepare food in lunch room _____
g. Serve food _____
h. Clean lunch room _____
i. Assist in evaluation _____
j. Responsible for management _____
k. Other_____ _____

Description:

18. What means have you found effective in providing parents with information about your school lunch?
Never tried any means _____
Tried _____
Tried but discontinued _____

a. Menus in newspapers _____
b. Newspaper articles _____
c. Information sent to parents _____
d. Community meetings _____
e. Invite parents to visit the school lunch _____
f. Radio _____
g. Other _____
h. None _____

Who is largely responsible for doing this?
a. Superintendent _____
b. Teachers _____
c. Principal _____
d. Pupils _____
e. School lunch manager _____
f. School lunch personnel _____
g. Community groups _____
h. Other _____ _____

Brief description:

19. How frequently do you find it advisable to evaluate the management or educational aspects of your school lunch?

| EVALUATION | LAST YEAR | EVERY YEAR | IRREGULAR INTERVALS | NONE |
|---|---|---|---|---|
| a. Financial | | | | |
| b. Facilities | | | | |
| c. Equipment | | | | |
| d. Nutritional | | | | |
| e. Food consumed | | | | |
| f. Dietary habits | | | | |
| g. Citizenship | | | | |
| h. Social | | | | |
| i. Administrative review | | | | |
| j. Other _____ | | | | |

Comment:

20. Who proposed and directed the evaluation program?

| | PROPOSED | DIRECTED | KIND |
|---|---|---|---|
| a. Superintendent | | | |
| b. Principal | | | |
| c. School lunch committee | | | |
| d. Community members | | | |
| e. School lunch manager | | | |
| f. School lunch personnel | | | |
| g. State school lunch personnel | | | |
| h. Other_____ | | | |

21. What other groups have you found helpful in this evaluation? Were others encouraged to help?

| | ENCOURAGED | PARTICIPATED |
|---|---|---|
| a. Teachers | | |
| b. Pupils | | |
| c. School lunch manager | | |
| d. School lunch personnel | | |
| e. Community members | | |
| f. Others_____ | | |

22. Do you believe this evaluation helped to improve your school lunch program?

No evaluation _____
Yes _____
No _____

If so, how?

a. Provided a guide for improving the program _____
b. Helped clarify objectives _____
c. Showed existing conditions _____
d. Other _____ _____

23. For which pupils is the school lunch provided?

a. Only those who can pay _____
b. All, regardless of ability to pay _____
c. Only those who live too far to go home _____
d. Other _____ _____

24. Where do those who bring their lunch eat?

a. School lunch dining room _____
b. Class room _____
c. Special lunch room _____
d. Other _____ _____

25. How much time is scheduled for the school lunch period?

a. Elementary _____
b. High school _____

26. Additional comment:

Part II: Teachers Assume and Share Responsibilities for Promoting the Educational Effectiveness of the School Lunch Program

Information obtained from:

Representative on the school lunch committee _____
Those who supervise during the lunch period _____
Advisors to groups of pupils planning school lunch projects _____
Those who contribute special training or experience _____
Those who correlate the school lunch program with class activities _____
Those who assist in an evaluation program _____

1. Mr. _____ has told me that you are a member of the school lunch committee and might be willing to tell me about some of the experiences you have had as a member of this committee.

Participate _____
Not participate _____

a. Attend meetings _____
b. Propose suggestions from other teachers _____
c. Promote school lunch projects _____
d. Other _____ _____

Comment:

2. Mr. _____ has told me that you assist in supervising pupils during the school lunch period. He thought you might be interested in telling me some of the experiences you have had in taking this responsibility.

a. Guidance of social behavior _____
b. Guidance in citizenship _____
c. Guidance in improving food habits _____
d. Other _____ _____

Brief description:

3. Mr. _____ has suggested that you might be willing to tell me some of the experiences you have had in working with pupils to plan school lunch projects.

a. Improve food habits in the lunchroom _____
b. Improve the appearance of the school lunchroom _____
c. Improve the school lunch facilities _____
d. Interpret the school lunch program to school and community _____
e. Provide guidance in social behavior _____
f. Provide guidance in citizenship _____
g. Evaluate the school lunch _____
h. Other _____ _____

Brief description:

Have you worked with other teachers on this? Names:
Do you know of others who have advised groups working with the school lunch? Names:

4. Mr. _____ has suggested that you might be interested in telling me about the responsibilities that you have assumed in helping the school lunch.

a. Home Economics
1. Menu planning _____
2. Food buying _____
3. Check menus _____
4. Management _____
5. Equipment buying _____
6. Records _____
7. Evaluation _____
8. Other _____ _____

b. Commercial
1. Collect money _____
2. Keep records _____
3. Figure costs _____
4. Make monthly reports _____
5. Type menus _____
6. Type reports _____
7. Other _____ _____

c. Shops
1. Make new equipment _____
2. Service and repair equipment _____
3. Other _____ _____

d. Art
1. Posters _____
2. Improve appearance of dining room _____
3. Other _____ _____

e. Agriculture
1. Food production _____
2. Other _____ _____

f. Other _____ _____

Brief description:

5. Mr. _____ has suggested that you might be willing to tell me of some of the experiences you have had in correlating the school lunch with class activities.

| | |
|---|---|
| a. Consider possible sources of food supplies for the school lunch | _____ |
| b. Plan menus for the school lunch program | _____ |
| c. Improve the appearance and facilities of the school lunchroom | _____ |
| d. Improve the eating habits in the school lunchroom | _____ |
| e. Improve social behavior in the lunchroom | _____ |
| f. Provide citizenship training in the school lunchroom | _____ |
| g. Assist with problems in food preparation and utilization | _____ |
| h. Assist with problems in food service | _____ |
| i. Apply sanitation principles and regulations in the school lunch kitchen and dining room | _____ |
| j. Provide secretarial service for the school lunch | _____ |
| k. Assist with financial control | _____ |
| l. Interpret the school lunch program to the school and community | _____ |
| m. Assist in an evaluation of the school lunch program | _____ |
| n. Other _____ | _____ |

Brief description:

Have you worked with other teachers on this? Names:
Do you know of other teachers who have been doing similar planning? Names:

6. Mr. _____ has told me that you helped evaluate the school lunch program. I am interested in your experiences in participating in such a program.

| | |
|---|---|
| a. Project planned by pupils | _____ |
| b. Class project | _____ |
| c. Other _____ | _____ |

Brief description:

Part III. Pupils Participate In Educational Activities Related to the School Lunch Program

Information obtained from:

Members of school lunch committee _____
Chairman of student school lunch committee _____
Chairman of groups planning and carrying out projects _____
Pupils working in the lunchroom _____

1. Mr. _____ has told me that you are a member of the school lunch committee and that you might be interested in telling me about some of the things you do as a member of this committee.

Participate _____
Not participate _____

a. Attend meetings _____
b. Bring suggestions from other pupils _____
c. Other _____ _____

Comment:

2. Mr. _____ has told me that you are a member of the student school lunch committee. He thought you might be willing to tell me about some of the things your committee does.

a. Clearing house for student opinion _____
b. Evaluate the school lunch _____
c. Plan and carry out projects _____
d. Other _____

Comment:

3. Mr. _____ has told me that you are (or have been) chairman of a group that has helped the school lunch (refer to specific project). He thought you might be interested in telling me about some of the things you have done or are planning to do.

a. Improve food habits in the lunchroom _____
b. Improve the appearance of the lunchroom _____
c. Improve the facilities of the lunchroom _____
d. Interpret the school lunch program to the school and the community _____
e. Provide guidance in social behavior _____
f. Provide guidance in citizenship _____
g. Evaluate the school lunch program _____
h. Other _____ _____

Have you worked with other groups on these projects? Names:

Do you know of other groups that have helped the school lunch? Names:

Comment:

4. What kind of work do you do in the school lunch?

a. Prepare food _____ d. Check meal tickets _____
b. Serve food _____ e. Collect money _____
c. Cleaning _____ f. Other _____

What do you receive for your work?

a. Money _____
b. Lunch _____
c. Volunteer _____

| | SUPERINTENDENT | MANAGER | COOK | OTHER |
|---|---|---|---|---|
| Who hired you? | _____ | _____ | _____ | _____ |
| Who tells you what to do? | _____ | _____ | _____ | _____ |
| Who teaches you how to do it? | _____ | _____ | _____ | _____ |

What have you learned while working in the school lunch?

a. Be careful with food _____ d. Cost of food _____
b. Cleanliness _____ e. Importance of saving food _____
c. Work faster _____ f. Other _____ _____

Comment:

Part IV: The Professionally Trained Manager and the School Lunch Personnel Contribute to the Educational Effectiveness of the School Lunch Program

Information obtained from: Manager _____
Home Economics Teacher _____
Cook-Manager _____
Other _____ _____

1. Do you find that talking over rules and regulations with others helps you with planning and managing the school lunch?
Yes _____
No _____
No opportunity _____

How do you suggest changes?

As a member of a school lunch committee _____
Direct contact with school administrator _____
Direct contact with community advisory group _____
Employee meetings _____

Comment:

2. Do you enjoy working with pupils to plan ways of helping the school lunch?
Yes _____
No _____
No opportunity _____

If so, what are some of the things you have planned with students?

a. Sponsor projects to
1. Improve food habits _____
2. Improve appearance of lunch room _____
3. Improve equipment _____
4. Interpret the school lunch program to the school and community _____
5. Improve social behavior in the lunch room _____
6. Improve citizenship in the lunch room _____
7. Other _____ _____

b. Work experiences
1. Preparing food _____
2. Serving food _____
3. Cleaning _____
4. Checking meal tickets _____
5. Collecting money _____
6. Other _____ _____

Brief description of experiences:

3. Do you think it's a good idea to encourage pupils to try new foods or to give other suggestions while you are serving them?

Yes _____
No _____
Never try _____

If so, how do you try to get them to eat better?

a. Suggest trying new foods _____
b. Suggest that they eat some of each food served _____
c. Answer questions about food _____
d. Serve new foods in small amounts _____
e. Urge them to drink milk _____
f. Display posters _____
g. Other _____ _____

Comment:

4. Do any pupils work regularly in the school lunch?

Yes _____
No _____

If so, what kinds of work do they do?

a. Prepare food _____
b. Serve food _____
c. Clean _____
d. Wash dishes _____
e. Check meal tickets _____
f. Collect money _____
g. Other _____ _____

Do you like to have the responsibility of planning their work?

Yes _____
No _____
Not responsible _____

Do you find it helpful to show them how to do the work?

Yes _____
No _____
Not responsible _____

Comment:

5. Have teachers ever asked you to help in planning to use school lunch activities as part of their class work for pupils? Example: class plans menus

Yes _____
No _____

If so, what are some of the things you have planned with teachers?

a. Consider possible sources of food supply _____
b. Plan menus _____
c. Improve appearance and facilities of the dining room _____
d. Improve eating habits in the lunch room _____
e. Improve social behavior _____
f. Provide citizenship training _____
g. Assist with problems in food preparation and utilization _____
h. Assist with problems in food service _____
i. Apply sanitation principles and regulations _____
j. Provide secretarial service _____
k. Assist with financial control _____
l. Interpret the school lunch program to the school and community _____
m. Other _____ _____

Who are some of the teachers that plan such activities with you?

Brief description of experiences

6. Do you like to "check-up" on your school lunch once in a while?

Yes _____
No _____
Never try _____

| | LAST YEAR | EVERY YEAR | IRREGULARLY |
|---|---|---|---|
| a. Equipment | _____ | _____ | _____ |
| b. Cleanliness | _____ | _____ | _____ |
| c. Costs | _____ | _____ | _____ |
| d. Menus | _____ | _____ | _____ |
| e. Amount and kind of food returned | _____ | _____ | _____ |
| f. Other | _____ | _____ | _____ |

Comment:

7. Have you ever had the opportunity to attend a county conference or school lunch short course?

| | NO OPPORTUNITY | OPPORTUNITY | ATTENDED |
|---|---|---|---|
| a. Conference called by school lunch supervisor | _____ | _____ | _____ |
| b. School lunch short course | _____ | _____ | _____ |

If so, did you find it helpful? Yes _____
No _____

How did it help you?

a. Learn more about menu planning _____
b. How to purchase foods _____
c. Care of equipment _____
d. Other _____ _____

Part V: Community Members Participate in the School Lunch Program

Information obtained from:

Chairman of community school lunch committee _____
Chairman of group that has sponsored or is sponsoring a project (other than PTA) _____
Member of school lunch committee _____
Other _____ _____

1. Mr. _____ Has told me that you are chairman of the community school lunch committee. He thought you would be willing to tell me about the responsibilities which your committee assumes. No committee _____

   a. Cooperate in proposing policies
      1. Direct contact with school administrator _____
      2. Representative on school lunch committee _____
      3. Direct contact with school lunch personnel _____
      4. Other _____ _____
   b. Interpret policies to other community members
      1. Parent-Teacher Association meeting _____
      2. Other community meetings _____
      3. Newspaper _____
      4. Other _____ _____
   c. Improve facilities of the lunch room
      1. Acquire equipment _____
      2. Construct equipment _____
      3. Decorate the lunch room _____
      4. Other _____ _____
   d. Provide volunteer workers for food production and service
      1. Production in gardens _____
      2. Food preservation _____
      3. Preparation in lunch room _____
      4. Food service _____
      5. Cleaning _____
      6. Other _____
   e. Assist in an evaluation program
      1. Periodic survey of home food habits of children _____
      2. Observe other changes in children _____
      3. Observe need for changes in children _____
      4. Other _____ _____
   f. Other _____ _____

   Brief description:

2. Mr. _____ has told me that you are (or were) chairman of a group that sponsored a project (name specific project if administrator indicates) for the school lunch. He thought you might like to tell me about what the group has done or is planning to do for the school lunch.

No project _____

a. Interpret policies to other community members _____
b. Improve facilities of the lunchroom _____
c. Provide volunteer workers for food production and service _____
d. Assist in an evaluation program _____
e. Other _____ _____

Do you know of other groups in the community that are planning projects for the school lunch program?

Description of project:

3. Mr. _____ has told me that you are a member of the school lunch committee. I am interested in some of the things you have been doing as a member of that committee.

No school lunch committee _____

a. Cooperate in proposing and developing school lunch policies _____
b. Cooperate in interpreting policies to other community members _____
c. Improve facilities of lunch room _____
d. Provide volunteer workers for food production and service _____
e. Assist in an evaluation program _____
f. Other _____ _____

Comment:

## Part VI: School Lunch Facilities

1. Average number of students served daily _____

2. Number of seats in dining room _____

3. Space provided for the lunch program _____

| | MEASURE | AREA | |
|---|---|---|---|
| a. Dining room | _____ | Total _____ | Per seat _____ |
| b. Linear table space | _____ | _____ | _____ |